Beogram CD 5500

Type 5131, 5132, 5133, 5134, 5135

Beogram CD 6500

Type 5136, 5137, 5138, 5139, 5140

Beogram CD 7000

Type 5151, 5152, 5153, 5154, 5155

CD-Mechanism Version II
Beogram CD 7000

Service Manual
Danish, English

BANG & OLUFSEN

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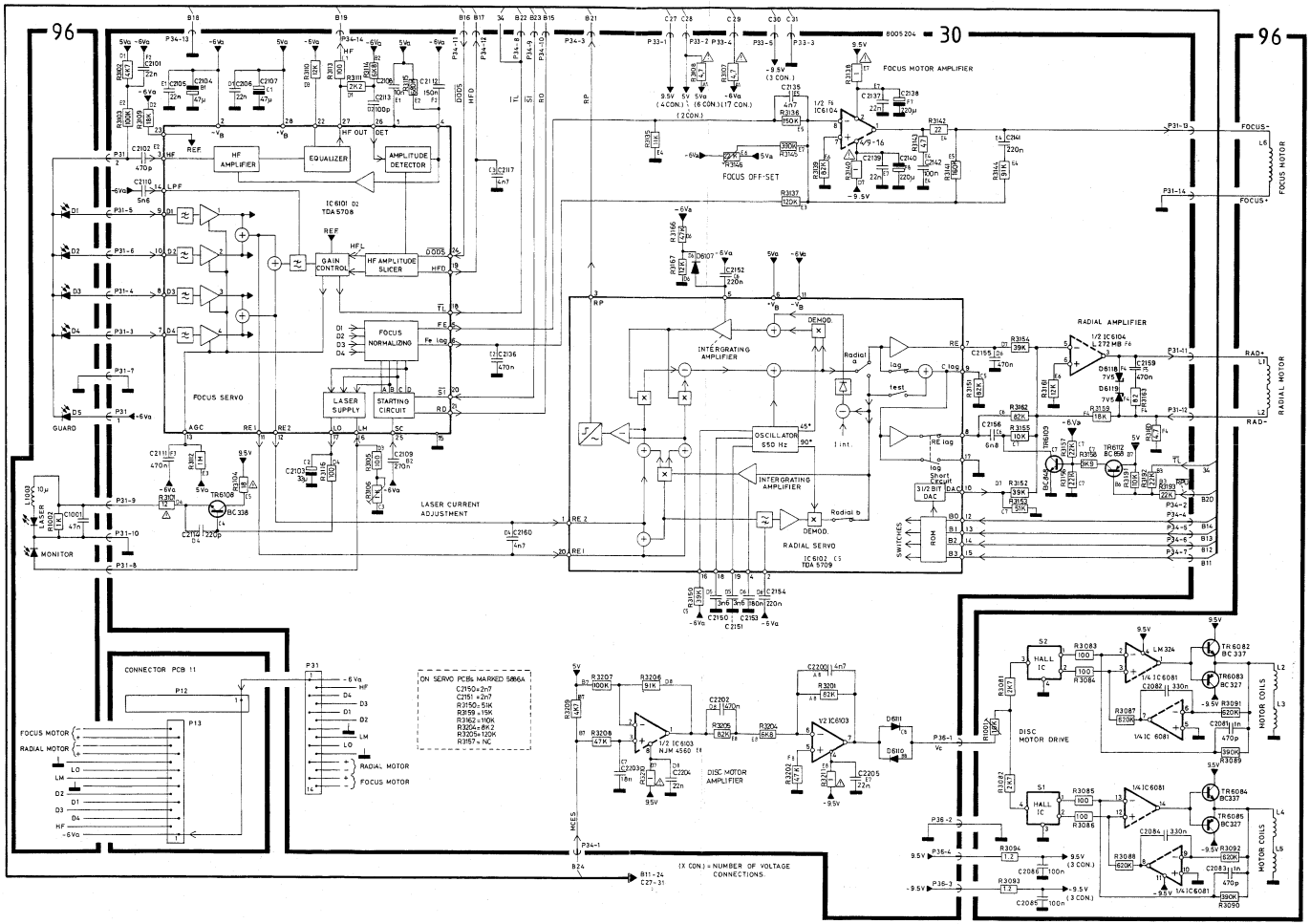
CD-Mechanism Version II

TECHNICAL SPECIFICATIONS

Frequency range	3-20.000 Hz ±0.3 dB
Signal-to-noise ratio	>100 dB/110 dB A-weighted
Dynamic range	>96 dB
Harmonic distortion incl. noise	<0.0025% at 0 dB
	<0.025% at -20 dB
Channel separation	>101 dB
Channel difference	<0.08 dB
Converter system	2 x 16 bit, 4 x oversampling 176.4 kHz
Low pass filter	Digital + Bessel/elliptical analog
Damping >20.000 Hz	>50 dB
Phase error between L and R	0 degree at 20-20.000 Hz
Output, analog	1.3 V RMS at 0 dB
Output, digital	For digital equipment
Power supply	Type no. 5131: 220 V
	Type no. 5132: 240 V
	Type no. 5133: 120 V
	Type no. 5134: 100 V
	Type no. 5135: 240 V
Power frequency	50-60 Hz
Power consumption	23 watts
Dimensions W x H x D	42 x 7.5 x 32.5 cm (16½" x 3" x 12¾")
Weight	6.3 kg (13.9 lbs)

Subject to change without notice

DIAGRAM A (Servo and Disc Motor System)



2-1

2-1

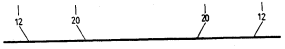
DIAGRAMFORKLARING

På diagrammet er der angivet typenumre på transistorer og IC'er i de tilfælde hvor typenummeret er entydigt for komponentens placering i kredsløbet – f.eks. TR20/BC 557B

Hvis positionsnummeret er efterfulgt af en stjerne **skal** reservedelsnummeret benyttes, da denne komponent er specielt udvalgt – f.eks. TR102*.

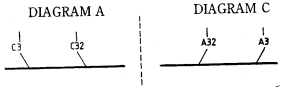
Ledningsforbindelser
Ledningsforbindelserne på diagrammet er samlet i »bundter«. De enkelte ledninger er forsynet med koder, der fortæller hvortil de går.

INTERN FORBINDELSE
PÅ EN DIAGRAMSIDE



Interne forbindelser på en diagramside angives med et tal. Knækket på ledningen viser i hvilken retning den anden ende af ledningen findes.

FORBINDELSE TIL EN ANDEN
DIAGRAMSIDE



Forbindelsen til en anden diagramside angives med et tal, samt bogstav indikation på det diagram forbindelsen går til.

Forsyningsspændinger
En pil og spændingen viser, hvor forsyningsspændingerne går ind i et print.

Eksempel: Ved siden af forsyningsspændingen står f.eks. 7 CON. Det betyder at denne pil, og dermed forsyning går til 7 steder på denne diagramside (7 CON. = 7 connections).

Symbol for sikkerhedskomponenter

Ved udskiftning af komponenter med dette symbol skal der anvendes komponenter med samme reservedelsnummer. Den nye komponent skal monteres på samme måde som den udskiftede.

EXPLANATION OF DIAGRAM

Type numbers of transistors and IC's have been indicated on the diagram in those cases where the type number is unambiguous for the position of the component in a circuitry – e.g. TR20/BC 557B.

If the position number is followed by an asterisk the spare part number **must be used** because this component has been expecially selected – e.g. TR102*.

Wiring Connections
The wiring connections on the diagram are assembled in "bundles". The individual wires are coded to indicate to where they are leading.

INTERNAL CONNECTION
ON ONE DIAGRAM PAGE

Internal connections on a diagram page are indicated by a number. The bend of the wire indicates in which direction the other end of the wire may be found.

CONNECTION TO ANOTHER
DIAGRAM PAGE

Connections to another diagram page are indicated by a number, as well as by a letter of the diagram to which the connections lead.

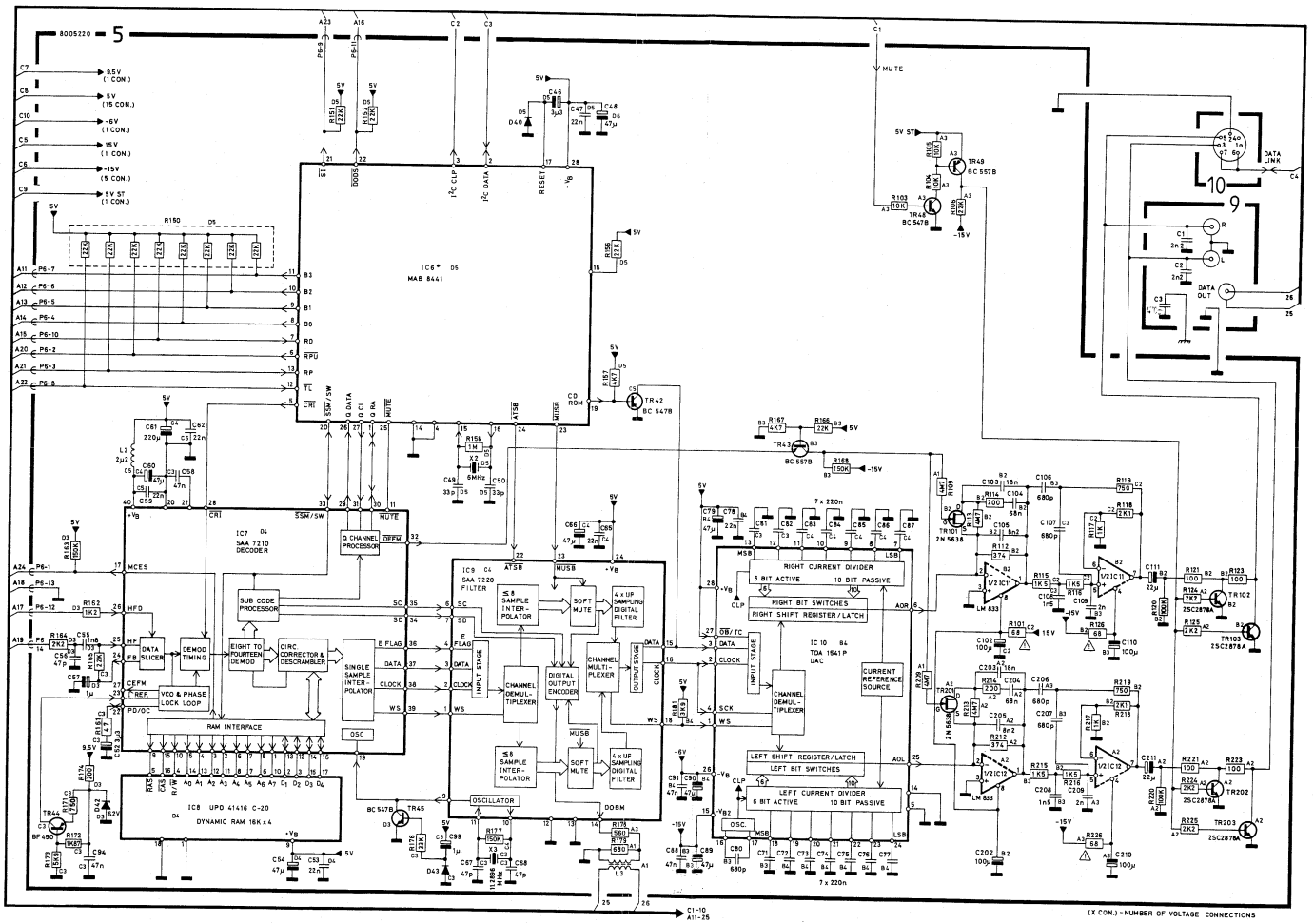
Supply Voltage
An arrow and the voltage show where the supply voltages are fed to a PCB.

Example: Next to the supply voltage it says e.g. 7 CON. This means that this arrow, and thus the supply goes to 7 different places on this diagram pages (7 CON. = 7 connections).

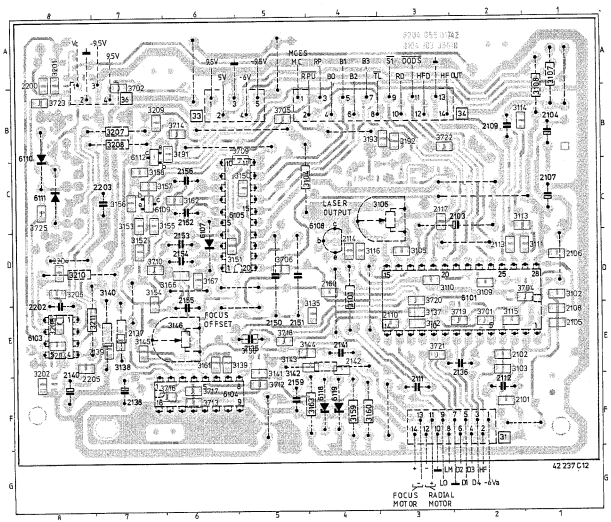
Symbol for Safety Components

When replacing components with this symbol components with identical part numbers are to be used. The new component must be fitted in the same way as the one replaced.

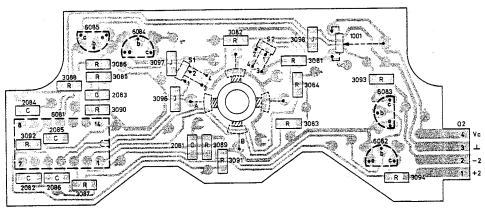
DIAGRAM B (Decoder)



SERVO PCB 30

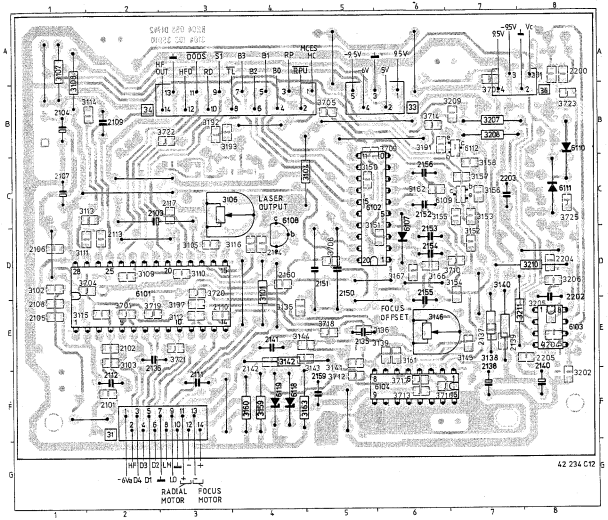


DISC MOTOR CONTROL



2-3

SERVO PCB 30



DISC MOTOR CONTROL

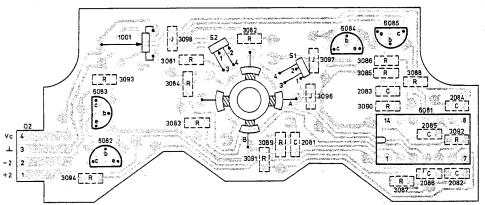
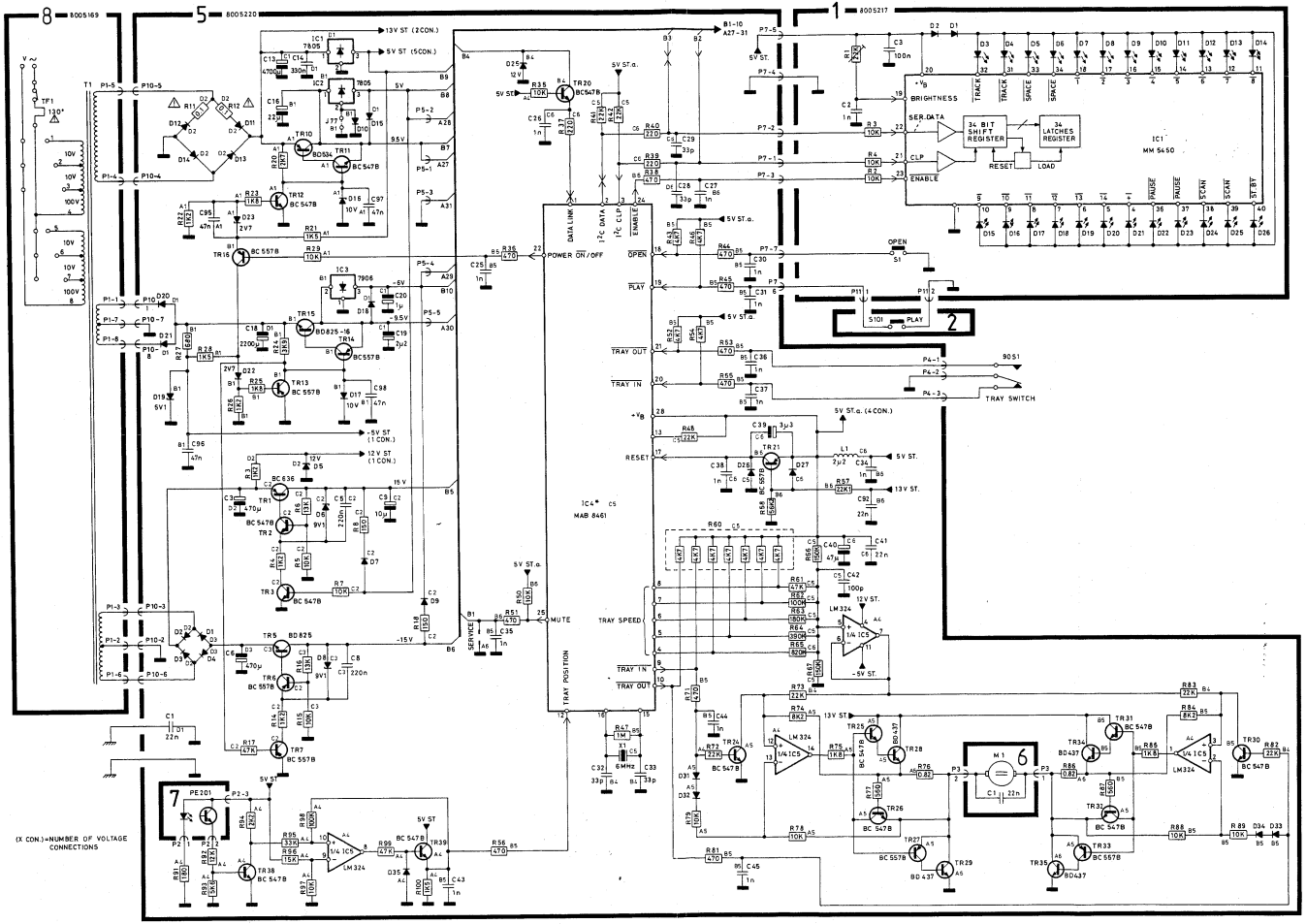
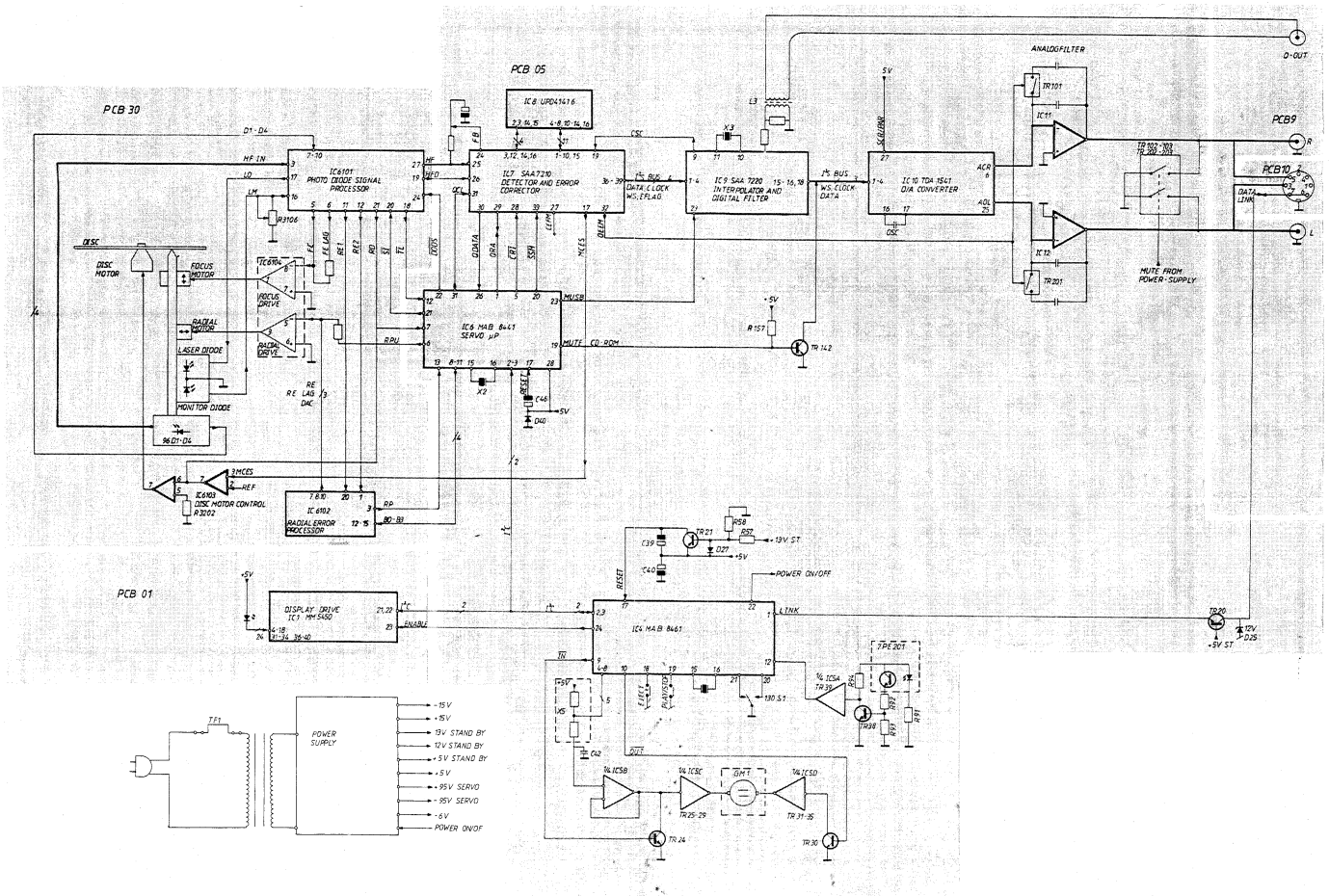


DIAGRAM C (Power Supply, Control and Display)

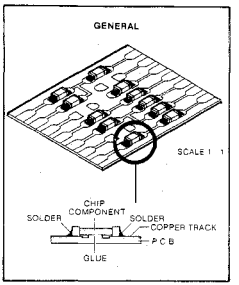


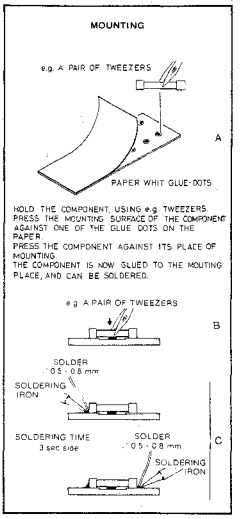
BLOCK DIAGRAM

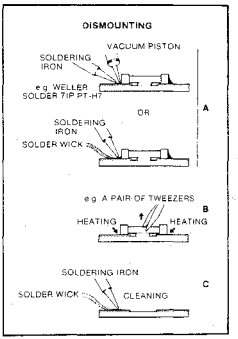


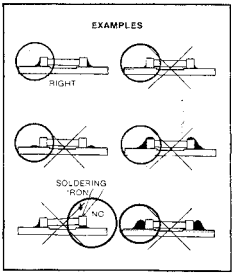
LIST OF ELECTRICAL PARTS

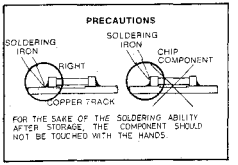
In the player chip components have been applied. For insertion and removal of chip components see the figure below.




MOUNTING
e.g. A PAIR OF TWEEZERS
A
PAPER WHIT GLUE-DOTS
HOLD THE COMPONENT, USING e.g. TWEEZERS.
PRESS THE MOUNTING SURFACE OF THE COMPONENT AGAINST ONE OF THE GLUE DOTS ON THE PAPER.
PRESS THE COMPONENT AGAINST ITS PLACE OF MOUNTING.
THE COMPONENT IS NOW GLUED TO THE MOUTING PLACE, AND CAN BE SOLDERED.
e.g. A PAIR OF TWEEZERS
B
SOLDER
0.5 - 0.8 mm
SOLDERING IRON
SOLDERING TIME
3 sec max
SOLDER
0.5 - 0.8 mm
SOLDERING IRON
C






PRECAUTIONS
SOLDERING IRON
SOLDERING IRON
CHIP COMPONENT
RIGHT
COPPER TRACK
FOR THE SAKE OF THE SOLDERING ABILITY AFTER STORAGE, THE COMPONENT SHOULD NOT BE TOUCHED WITH THE HANDS.

Standard resistors: *Resistors not mentioned are standard resistor.*

Resistors SMD 5% 1/8 W

	X1	X10	X100	X1K	X10K	X100K	X1M	X10M
1.0	5011333	5011295	5011274	5011197	5011272	5011207	5011320	5011332
1.2		5011296	5011299	5011273	5011310	5011195	5011321	
1.5		5011203	5011205	5011306	5011189	5011198	5011322	
1.8		5011297	5011300	5011286	5011311	5011196	5011323	
2.2	5011282	5011192	5011194	5011307	5011312	5011208	5011324	
2.7	5011283	5011275	5011301	5011183	5011271	5011316	5011325	
3.0					5011520			
3.3	5011289	5011202	5011188	5011184	5011313	5011317	5011326	
3.9	5011290	5011298	5011302	5011308	5011314	5011318		
4.7	5011291	5011191	5011303	5011193	5011284	5011206		
5.1						5011436		
5.6	5011292	5011276	5011304	5011309	5011199	5011288		
6.8	5011293	5011190	5011305	5011186	5011200	5011319		
8.2	5011294	5011185	5011187	5011285	5011315	5011201		

Resistors 5% 1/2 W

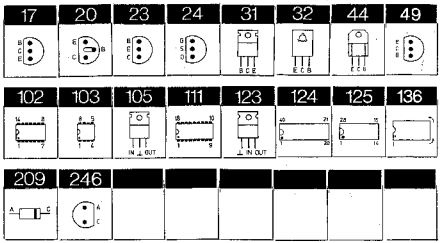
	X1	X10	X100	X1K	X10K	X100K	X1M	X10M
1.0		5011000	5011013	5011028	5011044	5010313	5011069	5011083
1.2	5011406	5011001	5011014	5011030	5011045	5011058	5010421	
1.5	5010727	5011002	5011015	5011031	5011046	5011059	5011071	
1.8	5010857	5010787	5011016	5011033	5011047		5011072	
2.2	5011335	5010708	5010815	5011034	5011048	5011061	5011074	
2.7		5010803	5011018	5010055	5011049	5011062	5011075	
3.3	5010255	5011007	5011019	5011037		5011063	5010381	
3.9		5010722	5011021	5010700	5011051		5010392	
4.7	5010765	5011009	5011022	5010035	5010036	5011065	5011078	
5.6		5011010	5011023	5011041		5011066	5011079	
6.8	5010874	5011011	5011024	5011042	5010810	5011067	5011080	
8.2		5011012	5011026	5011043	5010038	5011068	5011081	

Resistors 5% 1/4 W

	X1	X10	X100	X1K	X10K	X100K	X1M	X10M
1.0	5010592	5010506	5010065	5010040	5010059	5010049	5010054	5010638
1.2		5010595	5010128	5010153	5010046	5010047	5010665	
1.5	5011348	5010468	5010057	5010247	5010053	5010063	5010093	
1.8		5010822	5010362	5010066	5010135	5010072	5010791	
2.2	5010682	5010448	5010092	5010064	5010079	5010120	5010245	
2.7	5010925	5010403	5010090	5010298	5010141	5010083	5010431	
3.3		5010253	5010044	5010076	5010075	5010117	5010848	
3.9	5011377	5010622	5010070	5010069	5010060	5010073	5010714	
4.7	5010888	5010411	5010058	5010048	5010045	5010077	5011513	
5.6	5010706	5010151	5010067	5010041	5010061	5010071	5010658	
6.8	5010904	5010039	5010144	5010052	5010062	5010074		
8.2	5010880	5010055	5010068	5010154	5010091	5010505		

Resistors 5% 1/8 W

	X1	X10	X100	X1K	X10K	X100K	X1M	
1.0		5011464	5011357	5010816	5010935	5011440	5011459	5020875
1.2		5011351	5011084	5011442	5011338	5011341	5011175	
1.5		5011463	5011443	5011178	5011364	5011398	5011460	
1.8			5011350	5011361	5011344	5011468		
2.2	5011032	5011376	5010886	5011353	5010833	5011369	5011342	
2.7		5011471	5011355	5011362	5011366	5011370	5011478	
3.3			5011337	5010827	5011346	5011371	5011462	
3.9		5011438		5011157	5011457	5011372	5020876	
4.7	5011363	5011038	5011441	5011363	5010937	5011343		
5.6		5011412	5011358	5010885	5011166	5011340		
6.8		5011356	5011336	5010839	5011367	5011458		
8.2		5011466	5011354	5011339	5011368	5011373		



PCB 1, 8005217
Display

IC1Δ	8340467 **124** MM 5450N				
D1-D2	8300023 **209** 1N 4002		D3-D26	8330150 **246** LED red	
R1	5370068 22 kΩ 20% 0,1W				
C2	4010105 1 nF 10% 63V		C3	4130230 100 nF 20% 63V	
S1	7400268 contact 1 pol				
P11	7220580 Plug 2 pol				
To P7	6275711 Wire w/sockets 7/7 pin				

PCB 2, 8005218
Contact PCB

S101	7400268 contact 1 pol				
To P11	6275712 Wire w/sockets 2/2 pin				

PCB 5, 8005220
Decoder

IC1-IC2	8340065 **105** 7805 PWR supl. +5 1A				
IC3	8340931 **123** 7906 PWR supl. -6V 1A				
IC4Δ	8340957 **125** MAB 8461				
IC5	8340157 **102** LM 324				
IC6Δ	8340914 **136** MAB 8441 µC				
IC7Δ	8340841 **136** SAA 7210 Decoder				
IC8Δ	8340927 **111** UPD 41416 C				
IC9Δ	8340855 **136** SAA 7220 Digital filter				
IC10Δ	8340913 **136** TDA 1541 D/A Converter				
IC11-IC12	8340930 **103** LM 833N DUAL OP-AMP				
TR1	8320640 **17**	BC 636	TR27	8320152 **20**	BC 557B
TR2-TR3	8320097 **20**	BC 547B	TR28-TR29	8320427 **32**	BD 437
TR5	8320542 **44**	BD 825-16	TR30-TR32	8320097 **20**	BC 547B
TR6-TR7	8320152 **20**	BC 557B	TR33	8320152 **20**	BC 557B
TR10*	8320369 **31**	BD 534	TR34-TR35	8320427 **32**	BD 437
TR11-TR12	8320097 **20**	BC 547B	TR38-TR39	8320097 **20**	BC 547B
TR13-TR14	8320152 **20**	BC 557B	TR42	8320097 **20**	BC 547B
TR15	8320542 **44**	BD 825-16	TR43	8320152 **20**	BC 557B
TR16	8320152 **20**	BC 557B	TR44	8320567 **23**	BF 450
TR20	8320097 **20**	BC 547B	TR45	8320097 **20**	BC 547B
TR21	8320152 **20**	BC 557B	TR48	8320097 **20**	BC 547B
TR24-TR26	8320097 **20**	BC 547B	TR49	8320152 **20**	BC 557B
			TR101	8320722 **24**	2N 5638

24	49	209	212			

TR102-TR103	8320660	**49**	2SC 2878A	TR202-TR203	8320660 **49** 2SC 2878A
TR201	8320722	**24**	2N 5638		

D1-	8300023	**209**	1N 4002	D18	8300023 **209** 1N 4002
D4				D19	8300479 **209** ZPD 79B 5.1V
D5	8300407	**209**	ZPD 12V	D20-	8300023 **209** 1N 4002
D6	8300578	**209**	BZX 79 B9V1	D21	
			BZX 55 B9V1	D22-	8300222 **209** ZPD 2.7 V
D7	8300058	**209**	1N 4148	D23	
D8	8300578	**209**	BZX 79 B9V1	D25	8300407 **209** ZPD 12 V
			BZX 55 B9V1	D26-	8300058 **209** 1N 4148
D9	8300058	**209**	1N 4148	D27	
D10	8300142	**209**	AA 143	D31-	8300058 **209** 1N 4148
D11-	8300294	**212**	1N 5401	D35	
D14				D40	8300058 **209** 1N 4148
D15	8300023	**209**	1N 4002	D42	8300596 **209** 6.2V 2%
D16-	8300579	**209**	BZX 79 B10V	D43	8300058 **209** 1N 4148
D17			BZX 55 B10V		

R5	5020110		10 kΩ 1% 1/4W	R118	5011511 2,1 kΩ 1% 1/4W
R6	5020318		13 kΩ 1% 1/4W	R119	5011512 750 Ω 1% 1/4W
R11-	5020499		0.1 Ω 10% o.4W	R126	5020956 68 Ω 5% 0.14W
R12				R150	5030001 8 x 22 kΩ 5% 1/8W
R15	5020110		10 kΩ 1% 1/4W	R171	5011512 750Ω 1% 1/4W
R16	5020318		13 kΩ 1% 1/4W	R172	5021011 1.87 kΩ 1% 1/4W
R57	5020542		22.1 kΩ 1% 1/4W	R173	5020730 5.90 kΩ 1% 1/4W
R58	5020362		56.2 kΩ 1% 1/4W	R174	5011508 200 Ω 1% 1/4W
R60	5010862		7 x 4.7 kΩ 5% 1/8W	R212	5011507 374 Ω 1% 1/4W
R76	5020980		0.82 Ω 5% 1W	R214	5011508 200 Ω 1% 1/4W
R86	5020980		0.82 Ω 5% 1W	R215-	5011509 1.5 kΩ 1% 1/4W
R101	5020956		68 Ω 5% 0.14W	R216	
R112	5011507		374 Ω 1% 1/4W	R217	5011510 1 kΩ 1% 1/4W
R114	5011508		200 Ω 1% 1/4W	R218	5011511 2,1 kΩ 1% 1/4W
R115-	5011509		1.5 kΩ 1% 1/4W	R219	5011512 750 Ω 1% 1/4W
R116				R226	5020956 68 Ω 5% 0.14W
R117	5011510		1 kΩ 1% 1/4W		

C1	4000340		22 nF -20+80% 40V	C48	4200617 47 µF 20% 10V
C3	4200102		470 µF -10+100% 40V	C49-	4000339 33 pF 5% 63V
C5	4130308		220 µF 10% 63V	C50	
C6	4200102		470 µF -10+100% 40V	C52	4200625 3.3 µF 20% 50V
C8	4130308		220 nF 10% 63V	C53	4000340 22 nF -20+80% 40V
C9	4200524		10 µF 20% 25V	C54	4200617 47 µF 20% 10V
C13	4200020		4700 µF 25V	C55	4100195 1.8 nF 5% 63V
C14	4130309		330 nF 10% 63V	C56	4000137 47 pF 5% 63V
C16	4200544		22 µF 20% 16V	C57	4200512 1 µF 20% 50V
C18	4200548		2200 µF -10+50% 25V	C58	4130240 47 nF 10% 63V
C19	4200517		2.2 µF 20% 50V	C59	4000340 22 nF -20+80% 40V
C20	4200512		1 µF 20% 50V	C60	4200617 47 µF 20% 10V
C25-	4010035		1 nF 10% 63V	C61	4200122 220 µF -10+100% 10V
C27				C62	4000340 22 nF -20+80% 40V
C28-	4000339		33 pF 5% 63V	C65	4000340 22 nF -20+80% 40V
C29				C66	4200617 47 µF 20% 10V
C30-	4010035		1 nF 10% 63V	C67-	4000137 47 pF 5% 63V
C31				C68	
C32-	4000339		33 pF 5% 63V	C71-	4130308 220 nF 10% 63V
C33				C77	
C34-	4010035		1 nF 10% 63V	C78	4000340 22 nF -20+80% 40V
C38				C79	4200617 47 µF 20% 10V
C39	4200625		3.3 µF 20% 50V	C80	4010122 680 pF 10% 63V
C40	4200617		47 µF 20% 10V	C81-	4130308 220 nF 10% 63V
C41	4010107		22 nF -20+80% 40V	C87	
C42	4000204		100 pF 5% 63V	C88	4130240 47 nF 10% 63V
C43-	4010035		1nF 10% 63V	C89	4200688 47 µF 20% 50V
C45				C90	4200617 47 µF 20% 10V
C46	4200625		3.3 µF 20% 50V	C91	4130240 47 nF 10% 63V
C47	4000340		22 nF -20+80% 40V		

20	51	103	125	134			

C92	4000340 22 nF -20+80% 40V	C110	4200403 100 µF -10+100% 25V
C93-	4130235 47 nF 20% 63V	C111	4200480 22 µF 20% 10V
C94		C202	4200403 100 µF -10+100% 25V
C95-	4130210 47 nF 20% 63V	C203	4130267 18 nF 5% 63V
C98		C204	4130270 68 nF 5% 63V
C99	4200512 1 µF 20% 50V	C205	4100278 8.2 nF 2.5% 63V
C102	4200403 100 µF -10+100% 25V	C206-	4100249 680 pF 2.5% 63V
C103	4130267 18 nF 5% 63V	C207	
C104	4130270 68 nF 5% 63V	C208	4100230 1.5 nF 2.5% 63V
C105	4100278 8.2 nF 2.5% 63V	C209	4100279 2 nF 2.5% 63V
C106-	4100249 680 pF 2.5% 63V	C210	4200403 100 µF 1/4 10+100% 25V
C107			
C108	4100230 1.5 nF 2.5% 63V	C211	4200480 22 µF 20% 10V
C109	4100279 2 nF 2.5% 63V		

L1- L2	8020565 2.2 µH	L3	8020639 100 µH

X1- X2	8090009 6.0 MHz	X3	8090058 11.2896 MHz

P2	7220574 Plug 3 pol	P6	7220582 Plug 14 pol
P3	7220312 Plug 2 pol	P7	7220471 Plug 7 pol
P4	7220313 Plug 3 pol	P8	7220312 Plug 2 pol
P5	7220583 Plug 5 pol	P10	7220584 Plug 8 pol

PCB 6, 8005221
Motor

C1	4010107 22 nF -20-80% 40V		

To P3	6275715 Wire w/sockets 2/2 pin		

PCB 7, 8005219
Optocoupler

To P2	6275744 Wire w/sokets 3/3 pin		

PE201	8330196 Optocupler		

PCB 8, 8005169
Mains Transformer

P1	7220584 Plug 8 pol		

TF1	6609029 Thermal fuse 130° C		

	6275755 Audio wire bundle		

PCB 9, 8005223
Socket panel

C1- C2	4010103 2.2 nF 10% 63V	C3	4010128 470 pF 10% 63V

	7210384 Phono Socket (female)		

PCB 10, 8005223
Din socket

	7210600 DIN socket (female) 7 pol		

PCB 11, 8005222
PCB f. Flex Print

P12- P13	7210614 Socket 14 pol.		

PCB 30, 8005204
Servo

IC6101	8340991 **125** TDA 5708 C3	IC6103	8340993 **103** NJM 4560D
IC6102	8340992 **134** TDA 5709	IC6104	8340683 **103** L 272BH

TR6108	8320721 **020** BC 338-16	TR6112	8320616 **051** BC 858B
TR6109	8320615 **051** BC 848B		

209

D6107	8300058 **209** 1N 4148	D6118-	8300570 **209** HZ 7C2 7V5
D6110-	8300058 **209** 1N 4148	D6119	
D6111			

R3101	5020966 12 Ω 5% 1/3W	R3151	5011254 82 kΩ 2% 1/8W
R3102	5011234 4.7 kΩ 2% 1/8W	R3152	5011314 39 kΩ 5% 1/8W
R3103	5011256 100 kΩ 2% 1/8W	R3154	5011491 39 kΩ 2% 1/8W
R3104	5020967 18 Ω 5% 1/3W	R3155	5011241 10 kΩ 2% 1/8W
R3105	5011218 100 Ω 2% 1/8W	R3156-	5011245 22 kΩ 2% 1/8W
R3106	5370355 1 kΩ 20%	R3157	
R3107-	5020965 4.7 Ω 2% 1/3W	R3158	5011233 39 kΩ 2% 1/8W
R3108		R3159	5010547 18 kΩ 2% 1/4W
R3109	5011244 18 kΩ 2% 1/8W	R3160	5020971 4.7 Ω 1% 1/4W
R3110	5011490 12 kΩ 2% 1/8W	R3161	5011490 12 kΩ 2% 1/8W
R3111	5011230 2.2 kΩ 2% 1/8W	R3162	5011254 82 kΩ 2% 1/8W
R3112	5011267 1 mΩ 2% 1/8W	R3163	5010056 82 Ω 5% 1/4W
R3113	5011218 100 Ω 2% 1/8W	R3166	5011250 47 kΩ 2% 1/8W
R3114	5011238 6.8 kΩ 2% 1/8W	R3167	5011490 12 kΩ 2% 1/8W
R3115	5011319 680 kΩ 5% 1/8W	R3191	5011241 10 kΩ 2% 1/8W
R3116	5011218 100 Ω 2% 1/8W	R3192-	5011245 22 kΩ 2% 1/8W
R3135	5011586 11 kΩ 2% 1/8W	R3193	
R3136	5011259 150 kΩ 2% 1/8W	R3201	5011254 82 kΩ 2% 1/8W
R3137	5011257 120 kΩ 2% 1/8W	R3202	5011250 47 kΩ 2% 1/8W
R3138	5020964 1.0 Ω 2% 1/3W	R3204	5011238 6.8 kΩ 2% 1/8W
R3139	5011254 82 kΩ 2% 1/8W	R3205	5011254 82 kΩ 2% 1/8W
R3140	5020964 1.0 Ω 2% 1/3W	R3206	5011255 91 kΩ 2% 1/8W
R3141	5011587 160 kΩ 2%	R3207	5020263 100 kΩ 1% 1/4W
R3143	5011269 47 Ω 2% 1/8W	R3208	5020969 47 kΩ 1% 1/4W
R3144	5011255 91 kΩ 2% 1/8W	R3209	5011234 4.7 kΩ 2% 1/8W
R3145	5011318 390 kΩ 5% 1/8W	R3210-	5020964 1.0 Ω 2% 1/3W
R3146	5370254 22 kΩ 20% o.1W	R3211	
R3150	5011491 39 kΩ 2% 1/8W		

C2101	4000255 22 nF 10% 50V	C2139	4000255 22 nF 10% 50V
C2102	4000249 470 pF 5% 50V	C2140	4200745 220 mF 16V
C2103	4200414 33 mF -10+50% 16V	C2141	4130245 220 nF 5% 63V
C2104	4200482 47 mF 20% 10V	C2142	4000256 100 nf 10% 50V
C2105-	4000255 22 nF 10% 50V	C2150-	4130424 3.6 nF 160V 1%
C2106		C2151	
C2107	4200482 47 mF 20% 10V	C2152	4130206 220 nF 10% 100V
C2108	4000254 10 nF 10% 50V	C2153	4130314 180 nF 10% 63V
C2109	4130379 270 nF 5% 63V	C2154	4130206 220 nF 10% 100V
C2110	4000253 5.6 nF 10% 50V	C2155	4130405 470 nF 10% 50V
C2111	4130405 470 nF 10% 50V	C2156	4130338 6.8 nF 5% 100V
C2112	4130406 150 nF 5% 50V	C2159	4130293 470 nF 10% 63V
C2113	4000248 100 pF 5% 50V	C2160	4010173 4.7 nF 10% 50V
C2114	4000233 220 pF 5% 50V	C2200	4010173 4.7 nF 10% 50V
C2117	4010173 4.7 nF 10% 50V	C2202	4130405 470 nF 10% 50V
C2135	4130370 4.7 nF 5%	C2203	4130221 18 nF 5% 63V
C2136	4130405 470 nF 10% 50V	C2204-	4000255 22 nF 10% 50V
C2137	4000255 22 nF 10% 50V	C2205	
C2138	4200745 220 mF 16V		

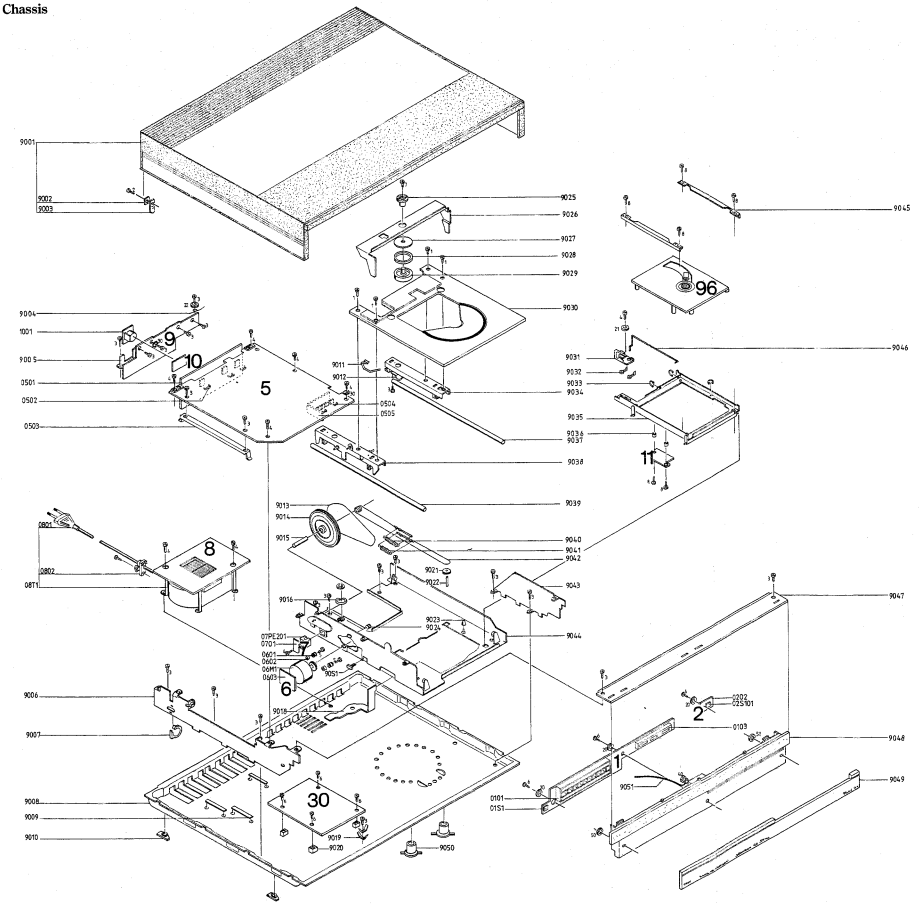
P31	7210614 Socket 14 pol	P34	7220657 Plug 14 pol
P33	7220652 Plug 5 pol	P36	7220651 Plug 4 pol

To P5	6275746 Wire w/sokets 5/5 pin	To P6	6275745 Wire w/sokets 14/14 pin

△ betyder at statisk elektricitet kan ødelægge komponenten.
△ indicates that static electricity may destroy the component.
△ bedeutet, daß statische Elektrizität die Komponente zerstören kann.
△ signifi que électricité statique peut détruire le composant.
* Speciel udvalgt eller bearbejdet eksemplar.
* Specially selected or adapted sample.
* Speziell ausgewähltes und bearbeitets Exemplar.
* Exemplaire, spécialement sélectionné et façonne.

MECHANICAL PARTSLIST

Chassis



01Modul 8005217 Display
0101 3131247 Housing Bargraph
3370152 Difus Tape Bargraph
01S1 7400268 Contact
0103 3131252 Housing Display
3370155 Difus Tape display

05Modul 8005220 Decoder
0501 3358228 Heat sink
0502 2816195 Spring (transistor)
0503 2566047 Guide rail
0504 2816000 Spring (transistor)
0505 3358202 Heat sink

09Modul 8005223 PCB socket panel

10Modul 8005223 PCB Din socket
1001 7210600 Plug 7 pol.

11Modul 8005222 Print f. flex print

30Modul 8005204 Servo

96Modul 8420138 Mechanism

02S101 7400268 Contact
0201 8005218 PCB

06M1 8400169 Motor
0601 2938253 Bushing
0602 2930074 Bushing
0603 8005221 PCB

07PE201 8330196 Optocoupler
0701 8005219 PCB

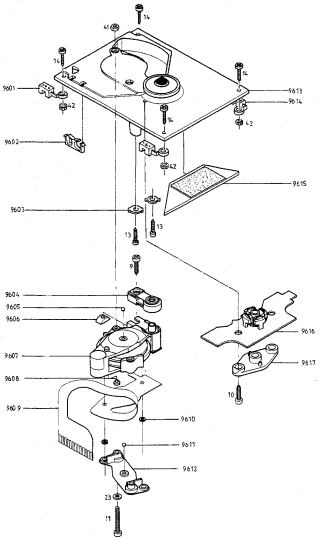
08T1 8005169 PCB 8 w/Transformer
0802 3152472 Holder for mains cord
0801 6271102 Mains cord (EU)
6270251 Mains cord (US)
6271119 Mains cord (J)
6270297 Mains cord (AUS)

90S1 7400322 Switch

9001	3414032	Cabinet	9027	2622412	Washer f. CD holder
9002	3034073	Bracket	9028	3356048	Magnet
9003	2391059	Bracket	9029	3152536	Holder f. CD
9004	2816243	Spring	9030	3454479	CD tray
9005	7219065	Bracket f. socket panel	9031	2751020	Driving plate
9006	3112331	Chassis (for PCB)	9032	2851214	Arm
9007	3152366	Wire holder	9033	3152118	Wire holder
9008	3454445	Bottom	9034	3150069	Holder
9009	3152101	Wire holder	9035	3114289	Chassis f. CD mech.
9010	3035119	Slide shoe	9036	2930099	Bushing
9011	2816239	Leaf spring	9037	2830128	Shaft bar short
9012	2816240	Spring for trolley shoe	9038	3150068	Holder
9013	2732083	Belt	9039	2830129	Shaft bar long
9014	2724076	Tacho wheel	9040	2810216	Spring
9015	2830134	Shaft	9041	2810215	Spring
9016	3010029	Stop block rubber	9042	3955041	Wire
9018	6141178	Flex PCB	9043	2542698	Angle f. front
9019	7500176	Solder tag	9044	3112334	Chassis
9020	2576109	Spacer	9045	2542699	Angle
9021	2724069	Cord pulley	9046	2850141	Arm
9022	2830133	Shaft	9047	2560218	Bracket f. front
9023	3010007	Stop blok	9048	3114273	Chassis front
9024	2938253	Rubber bushing	9049	2568978	Front panel
9025	2905120	Seat f. CD holder	9050	3152560	Transport screw
9026	2510158	Bracket f. CD holder	9051	6032258	Wire

4-2

4-2



	9601	3333016	Rubber holders	9610	2622426 Washer f. foil
	9602	3152593	Clamp f. flexprint	9611	2917024 Ball
	9603	3034077	Transport screw	9612	2905116 Pivot plate
□	9604	8330210	Focusunit	9614	3333015 Rubber holders
	9605	2917024	Ball	9615	3342046 Weighing block
	9606	2389077	Spec. nut		The disc motor system pos.
○	9607△	3131296	Rafoc		no. 9613, 9616 and 9617 are
	9608	3010031	Rubber stop		one unit, part no. 3114292
	9609	6141131	Flex print		

□ Replacement of 9604 see page 5-5, 5-9
○ Replacement of 9607 see page 5-4, 5-5, 5-12

Screws, washers, etc.

1	2038097	Screw M3x6 mm	13	2013145	Screw 3 x 12 mm
2	2043016	Screw AM 4x10 mm	14	2034064	Screw 2 x 10 mm
3	2038096	Screw M3x5 mm	20	2622052	Washer 3.2x8x1 mm
4	2038098	Screw M3x8 mm	21	2622348	Washer 2.3 mm
5	2036016	Screw AM 2.6x6 mm	22	2622321	Washer 3.2 mm
6	2013136	Screw 3x6 mm	23	2624013	Washer 3 mm
7	2013137	Screw 3x10 mm	30	2625002	Tooth lock washer 3.2
8	2038103	Screw AM 3x12 mm	40	2380011	Nut M3
9	2011038	Screw 2.2x10 mm	41	2380012	Nut M3
10	2013149	Screw 2.9x16 mm	42	2380147	Nut M3
11	2038120	Screw 3x25 mm	50	2390001	Spring washer 2.3 DIN
12	2013094	Screw M 2.9x6.5 mm	51	2390103	Spring washer Ø2x0.25

Parts not shown

7500157	Crimp f. wire	3629104	Screw driver T20
3391251	Outer carton	3634030	Glass disc
3391997	Insert for packing	3634031	Test disc 5 and 5A
3397571	Foam packing, set	3634032	Magnet ring
3946048	Foil	3505479	Owner's Manual DK
6270213	Signal cable 7 pol.	3505480	Owner's Manual S
3629107	Blade T6 short	3505481	Owner's Manual SF
3629037	Blade T8 short	3505482	Owner's Manual GB
3629102	Blade T10 long	3505483	Owner's Manual D
3629038	Blade T10 short	3505484	Owner's Manual NL
3629103	Blade T20 short	3505485	Owner's Manual F
3629109	Screw driver T6	3505486	Owner's Manual I
3629108	Screw driver T8	3505487	Owner's Manual USA
3629047	Screw driver T10		

MEKANISKE JUSTERINGER

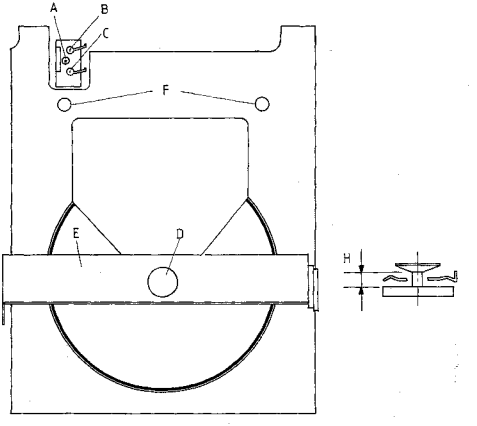
Højde på løbeværket

Justeringen foretages med de 4 skruer i gummidæmperne i hjørnerne på løbeværket. De 2 bageste skruer kan justeres gennem hullerne F i pladeskuffen når skuffen er inde, og de 2 forreste når skuffen er næsten ude. Der bør justeres lige meget og i samme retning på alle 4 skruer. For at nå de 2 forreste skruer skal den lange vinkel over fronten tages af, og for at lette justeringen vippes fronten ned.

Læg CD-plade i og tryk pladeskuffen ind.

Juster de 4 nævnte skruer til CD-pladens underkant er 0,3 mm ± 0,3 mm over pladeskuffens overkant når pladeskuffen er inde.

Centrering af løbeværk



Læg en CD-plade i og tryk pladeskuffen ind.

Skruen A løsnes.

Ekscentrik B justeres til CD pladen er midt i fordybningen i pladeskuffen.

Skruen A spændes.

MECHANICAL ADJUSTMENTS

Height of drive mechanism

Make the adjustment with the 4 screws in the rubber dampers at the corners of the drive mechanism. The 2 rearmost screws may be adjusted through the holes F in the disc drawer when the drawer is in, and the 2 frontmost screws may be adjusted when the drawer is almost out. All 4 screws should be adjusted identically. In order to reach the 2 frontmost screws, the long bracket at the top of the front should be removed, and the front should be tilted down to facilitate the adjustment.

Insert a CD and push in the disc drawer.

Adjust the 4 screws mentioned until the lower edge of the CD is 0.3 mm ± 0.3 mm above the upper edge of the disc drawer when the disc drawer is in.

Centring of drive mechanism

Load a CD and push the disc drawer in.

Loosen screw A.

Using eccentric B, adjust until the CD is at the centre of the depression in the disc drawer.

Tighten screw A.

Centrering af vinkel for pladeholdermagnet
Pladeskuffen trykkes ind.

Skruen A skal være løsnet.

Ekscentrik C justeres til pladeholdermagneten D ligger midt i hullet i vinklen E.

Skruen A spændes.

Højde af vinkel for pladeholdermagnet
Læg en CD plade og tryk pladeskuffen ind.

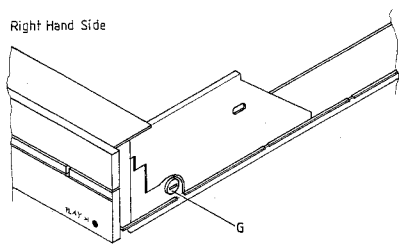
Centring of bracket for disc clamping magnet
Push in the disc drawer.

Screw A must be loosened.

Using eccentric C, adjust until the disc clamping magnet D is at the centre of the hole in the bracket E.

Tighten screw A.

Height of bracket for disc clamping magnet
Insert a CD and push in the disc drawer.



Skruen G justeres til højden af vinklen E ligger midt i frigangen H på plademagneten D.

Kontroller at pladeholdermagneten ikke går imod metalpladen, som er limet på den bageste del af pladeskuffen, når skuffen trækkes ud og ind.

Stop position for pladeskuffe
Pladeskuffen skal være trykket helt ind.

Medens skuffen trykkes ind mod stop, justeres unbrakoskruen (5 mm) under bunden, indtil skuffeforkanten flugter med fronten på apparatet.

Højde pladeskuffe forkant
Pladeskuffen trykkes ind.

De 2 skruer under den forreste del af bunden justeres til overkanten af pladeskuffen flugter med overkanten af aluminiumslisten på fronten.

By means of screw G, adjust until the height of the bracket E is at the centre of the clearance H between the bracket and the disc magnet D.

Make sure that the disc clamping magnet does not hit the metal sheet which is glued onto the rearmost part of the disc drawer when the drawer is pulled out and pushed in.

Stop position for disc drawer
The disc drawer must be fully depressed.

While the drawer is pressed against stop, adjust the allen screw (5 mm) in the bottom until the front edge of the drawer is flush with the front of the set.

Height of front edge of disc drawer
Push in the disc drawer.

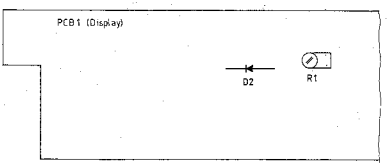
By means of the 2 screws under the front part of the bottom, adjust until the upper edge of the disc drawer is flush with the upper edge of the aluminium strip on the front.

ELEKTRISKE JUSTERINGER

Lysintensitet (Brightness)

ELECTRIC ADJUSTMENTS

Brightness



1D2 loddes fri og løftes i den ene ende.

Milliamperemeter sættes ind i serie med 1D2.

Ilæg en CD plade med mere end 15 numre.

Tryk PLAY.

1R1 justeres til der måles 153 mA ±5 mA.

Unsolder 1D2 and elevate it at one end.

Connect a milliammeter in series with 1D2.

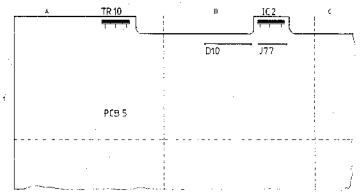
Insert a CD with more than 15 tracks.

Press PLAY.

Adjust 1R1 until a measurement of 153mA ±5mA is obtained.

+5V strømforsyning

+5V power supply



Ilæg en CD plade og tryk PLAY.

Mål DC spændingen fra ben 20 til ben 40 på 5IC7. (SAA 7210).

NB! Der skal måles direkte på IC'en.

5D10 skal være kortsluttet (5J77).

Hvis den målte spænding er lavere end 4,85 V skal 5J77 afbrydes.

Load a CD and press PLAY.

Measure the DC voltage from pin 20 to pin 40 of 5IC7 (SAA 7210).

NOTE: The measurement must be made on the IC directly.

5D10 must be short-circuited (5J77).

If the measured voltage is less than 4.85V, 5J77 has to be disconnected.

KONTROL, REPARATION OG JUSTERING AF CD LØBEVÆRK

For at forhindre metalsplinter i at komme ned i løbeværket, er det nødvendigt at reparationspladsen er helt ren.

PHOTODIODERNE OG LASEREN ER MERE FØLSOMME OVERFOR STATISK EL END MOS IC'er. UFORSIGTIG BEHANDLING UNDER SERVICE KAN REDUCERE LEVETIDEN DRASTISK. DERFOR SKAL DET SIKRES AT ARBEJDSPLADSEN ER BESKYTTET MOD STATISK EL.

Ved reparation af løbeværket skal der udvises forsigtighed for at undgå beskadigelse af focus bladfjederen.

Servicering af RAFOC enheden (= Radial og Focus enhed, pos. nr. 9607, se exploded view).

Tag CD løbeværket ud af apparatet.

RAFOC enheden kan tages ud ved at løsne de 2 stk. 2,9 x 16 mm fastspændingsskruer.

Bemærk: Når de nævnte skruer løsnes, er de 2 møtrikker på oversiden af løbeværket løse. Armlejet pos. 9612 trækkes ud, og RAFOC enheden med det fleksible print kan nu tages ud.

BEMÆRK! Ved montering af RAFOC enheden, er det meget vigtigt, at det fleksible print ligger helt op mod topchassiset på CD løbeværket, der hvor holder pos. 9602 skal holde printet fast. For at forhindre at RAFOC enheden kan gå imod det fleksible print, kan det være nødvendigt at lime printet fast mod topchassiset med hurtig tørrende lim. Dette skal dog gøres meget forsigtigt.
Hvis laser eller monitor diode er defekt, er det nødvendigt at skifte RAFOC enheden pos. 9607. Efter montering af RAFOC enheden skal det sikres, at enheden kan bevæges helt frit gennem hele vandringen.
Dette kan kontrolleres med en trykfjedermåler, som holdes imod magneten på fokusenheden. Friktionen skal være under 25 mN gennem enhedens hele vandring.

CHECK, REPAIR AND ADJUSTMENT OF THE CD MECHANISM

To prevent loose metal objects from getting in the CD mechanism, it will be necessary to see to a clean repair station.

THE PHOTODIODES AND THE LASER ARE MORE SENSITIVE TO ELECTROSTATIC DISCHARGES THAN MOS ICS.
CARELESS HANDLING DURING SERVICING MAY REDUCE LIFE EXPECTATION DRASTICALLY. THEREFORE, CARE SHOULD BE TAKEN, THAT THE REPAIR STATION IS PROTECTED AGAINST STATIC ELECTRICITY.

When effecting repairs to, or making measurements on the CD mechanism, be careful not to damage the flat springs of the focusing unit.

Servicing the RAFOC unit (= Radial and Focusing unit, pos. 9607. See exploded view).

Take the CD mechanism out of the set.

The RAFOC unit can be removed after the two fixing screws 2.9 x 16 mm have been loosened.

Caution: when doing so, the two nuts M3 on the upper side of the CD mechanism come loose. Now the pivot plate pos. 9612 can be removed. After removing the clamping piece, pos. 9602 the RAFOC unit/flexible PCB assembly can be taken out.

ATTENTION: When mounting the RAFOC unit, see to it that the flexible PCB rest well against the mounting plate at the height of the clamping piece (pos. 9602). In some cases, after exchanging the RAFOC unit/flexible PCB assembly, it may be necessary to glue the flexible PCB with a fast-drying glue to prevent the RAFOC unit from rubbing against the flexible PCB.
The gluing should be done very carefully.
When the laser and/or the monitor diodes are defective, it will be necessary to replace the RAFOC unit, pos. 9607.
After mounting the RAFOC unit you should make sure that the arm runs clear over the entire disc diameter.
This can be checked by means of a spring-pressure gauge which is held against the magnet of the focusing unit. The friction of the arm, measured over the entire meter reading, may not be greater than 25 mN.

En hurtig kontrol af RAFOC enhedens frigang kan gøres i service position 1, hvor enheden kan bevæges gennem hele vandringen med OPEN og PLAY tasterne. (Se reparationstips side 7.1).
Efter montering af RAFOC enheden skal laserarmens vinkelindstilling kontrolleres. Playability efter montering af RAFOC enheden kan afprøves med testplade 5A.

Udskiftning af servo PCB30, RAFOC enhed pos. nr. 9607 eller focus enhed pos. nr. 9604
(Kun i apparater med 1 potentiometer på PCB30).

Ved udskiftning af en af de nævnte dele, skal følgende kontrolleres:
Tilslut DC voltmeter med + til 30P31 ben 13 og - til 30P31 ben 14 (stel).

Hvis der er monteret en 820 kohms modstand fra ben 8 på 30IC6104 til -6 Va, afmonteres denne.

CD løbeværket skal stå helt vandret.

Ilæg testplade 5A (bestillingsnr. 3634031). Sæt apparatet i servicepoition. (Kortslut servicestikket på PCB5 samtidig med at netstikket sættes i).
Tryk derefter OPEN og PLAY samtidigt 3 gange.

Hvis spænding overstiger +165 mV monteres 820 kohms modstanden fra ben 8 på 30IC6104 til -6 Va.

Justering af Focus offset (er ikke muligt i de først producerede apparater).

Ilæg testplade 5A (bestillingsnr. 3634031).

Sæt apparatet i serviceposition 2 ved at kortslutte servicestikket på PCB5 samtidig med at netstikket sættes i.

Tryk derefter »OPEN« og »PLAY« samtidigt og 2 gange.

Hvis »2« i displayet bliver ved med at blinke, justeres 30R3146 til »2« lyser konstant.

Sæt apparatet i serviceposition 4 ved at trykke »OPEN« og »PLAY« samtidigt og 2 gange (»4« i displayet skal lyse, og pladen skal rotere).

Tilslut DC voltmeter over 30C2136.

Juster 30R3146 til der måles 400 mV ±40 mV.

A fast check of the clearance of the arm is possible in service position 1. The RAFOC unit can be moved across the diameter of the disc by operating the OPEN and PLAY keys. (See repair hints page 7.1).
After mounting the RAFOC unit the angle setting of the laser arm should be checked.
Playability after mounting the RAFOC unit can be checked using test disc 5A.

Replacing the servo PCB30, RAFOC unit pos. no. 9607 or focusing unit pos. no. 9604
(Only in a CD with a potentiometer on PCB30).

When replacing one of the mentioned parts, the following shall be checked:
Connect DC voltmeter with + to 30P31 pin 13 and - to 30P31 pin 14 (ground).

If a resistor of 820 kohms is mounted from pin 8 of 30IC6104 to -6 Va, this should be dismounted.

The CD mechanism must be placed completely horizontally.

Put test disc 5A (part no. 3634031) on the turntable. Put the player in service position. (Short circuit the service plug on PCB5 and plug into mains supply at the same time).
Then press OPEN and PLAY simultaneously and 3 times.

If the voltage measured, exceeds +165 mV, the resistor of 820 kohms shall be mounted from pin 8 of 30IC6104 to -6 Va.

Adjustment of DC focus offset (not possible in the first productions of the unit).

Load test disc 5A (order no. 3634031).

Set unit to service position 2 by short-circuiting the service point on PCB5 while inserting the mains plug.

Then press "OPEN" and "PLAY" simultaneously twice.

If "2" on the display keeps flashing, adjust 30R3146 until "2" light constantly.

Set the unit to service position 4 by pressing "OPEN" and "PLAY" simultaneously twice. ("4" on the display should light and the disc rotate).

Connect DC voltmeter across 30R2136.

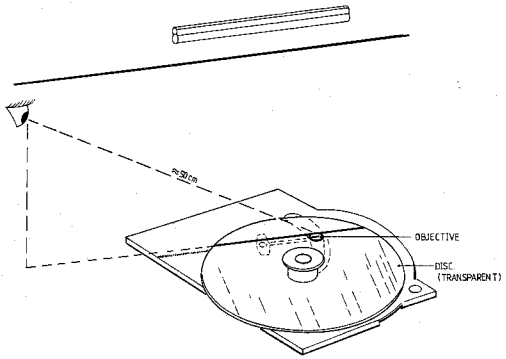
Adjust 30R3146 until the reading is 400 mV ±40 mV.

Kontrol af vinkel indstilling på laserarm

Vinkel indstillingen kan kontrolleres efter glaspladem-etoden, som er forklaret i det efterfølgende.

Checking the angle setting

The angle setting can be checked with the glass-disc method which is explained below.



Læg glasplade (bestillingsnr. 3634030) på pladeholderen. Glaspladen skal hvile jævnt mod pladeholderen.

Put glass disc part no. 3634030 on the turntable. Male sure that the glass disc beds down well on the turntable.

Placer CD løbeværket under en lyskilde hvorunder der er en lige linie (f.eks. et lysstofrør med gitter). Afstanden mellem løbeværket og lyskilden skal være større end 1,5 m.

Place the CD mechanism under a light source, under which there is a straight line (e.g. under a fluorescent tube with grid).
The distance between the CD mechanism and the light source should be more than 1.5 m.

Placer laserarmen midt i dens radiale vandring.

Set the arm to mid-position of its radial track.

Drej løbeværket indtil laserarmen er parallel med linien fra lyskilden.

Turn the mechanism until the arm is parallel to the line under the light source (see figure below).

Se i forlængelse af den reflekterede linie på henholdsvis glasplade og optik. Der må ikke være mere end 4 mm afstand mellem de 2 linier.

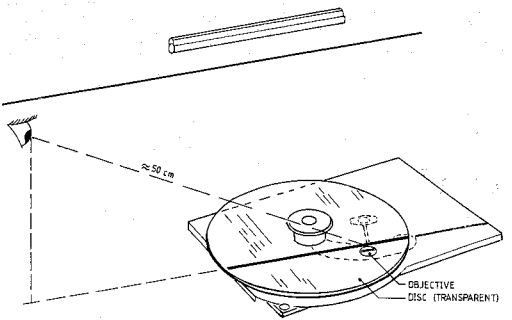
Look into the direction and in the extension of the line to the reflection there of on the glass disc and in the objective. These lines should not be apart more than 4 mm.

Placer CD løbeværket sådan at linien der reflekteres af optikket løber gennem optikkets centrum.

Place the CD mechanism so that the reflected line runs across the centre of the objective.

Hvis linien der reflekteres af glaspladen er indenfor optikkets overfalde, er vinkel indstillingen i orden.

When the line that is reflected by the glass disc stays within the surface of the objective, the angle setting is correct.



Drej CD løbeværket 90° i forhold til forrige position.

Hold laserarmen i midterposition.

Gentag ovenstående kontrol.

Justering af vinkel indstilling

Hvis kontrol af vinkel indstilling viser, at vinklen er udenfor tolerance, skal den *ikke* justeres til minimum afvigelse men blot indenfor tolerance.

Efter justering af vinkel indstilling, skal laserarmens friktion kontrolleres. Dette kan gøres med en tryk-fjedermåler, som holdes mod magneten på focus-enheden.

Friktionen skal være under 25 mN gennem enhedens hele vandring.

Hvis friktionen er for høj skal RAFOC enheden udskiftes og vinkel indstillingen skal kontrolleres igen.

Turn the CD mechanism through 90° relative to the previous position.

The arm must be kept in mid-position (see figure above).

Repeat the previous check.

Adjusting the angle setting

If a check on the angle setting shows that the angle falls outside the toelerance, the angle should *not* be adjusted for minimum deviation, but it should be adjusted within the tolerance.

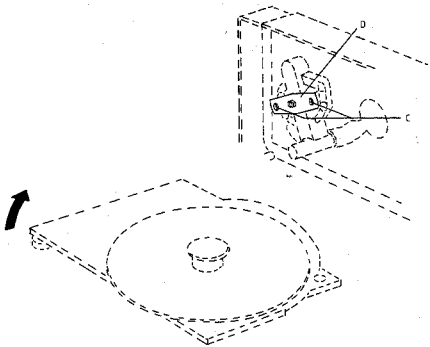
After adjusting the setting, the friction of the arm must be checked. This is done by means of a spring pressure gauge which is held against the magnet of the focusing unit.

The friction of the arm, measured over the entire meter reading, should not be greater than 25 mN.

When the friction appears to be too high, the RAFOC unit must be replaced and the angle setting shall be checked once more.

Justering af vinkel indstilling gøres som beskrevet i det efterfølgende:

Adjustment of the angle setting is performed as follows:



Skruerne C løsnes indtil armlejet D kan forskubbes. Vinkelindstillingen justeres ved at skubbe armlejet D som vist på nedenstående tegning.

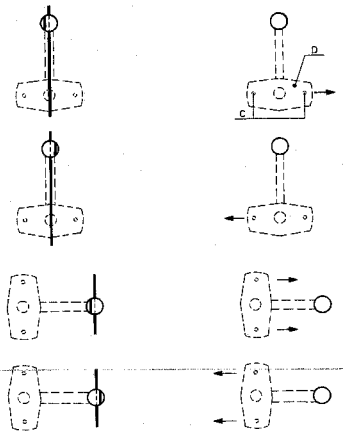
Loosen screws C (see figure above) until bearing plate D can be displaced. Correct the angle setting by moving the bearing plate into the direction shown in figure below.

Skruerne C spændes medens det sikres at indstillingen ikke flytter sig.

Tighten screws C, ensuring that the setting does not drift.

Foretag kontrol af vinkelindstilling.

Then double check the setting in two directions.



Udskiftning af fleks PCB pos. 9609
Afmonter RAFOC enheden.

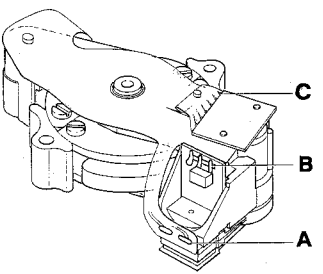
De 2 tilslutninger A kan nu loddes fra, og før tilslutningerne C loddes fra, skal placeringen af fleks-PCB'en markeres på fotodiode PCB'en.

Dette gøres ved hjælp af en blyant, så den nye fleks-PCB kan placeres i nøjagtig samme position.

Replaceing the flexible PCB pos. 9609
Demount the RAFOC unit.

Desolder the connections A of the flexible PCB.

Before desoldering the connections C of the photodiode PCB, the position of the connecting points of the photodiode PCB should be marked, so that afterwards the PCB can correctly be replaced.



Fralodningen af de 6 tilslutninger C skal gøres ved at varme hver enkelt tilslutning op og løsne forbindelsen med feks. bagkanten af et skalpelblad.
N.B. Dette skal gøres med stor forsigtighed.
Herefter fraloddes de 4 tilslutninger til radial spolerne inden de 3 tilslutninger (B) til laser PCB'en loddes fra.

Now the 6 connections C of the photodiode PCB can be desoldered by heating the pins C one by one until the flexible PCB comes loose.
This should be done very carefully.
Desolder the 4 connections of the radial coils.
Unsolder the 3 connections (B) of the laser PCB.

PCB'en kan nu løftes af, og inden den nye PCB monteres, loddes et lille lag loddetin på tilslutningerne C.

The PCB can now be taken off, and before the new PCB is mounted, the connections C should be provided with a small coating of tin.

Den nye fleks-PCB placeres nu korrekt iflg. blyantsmærkerne og tilslutningerne til de radiale spoler loddes nu fast inden tilslutningerne A og B.

The new PCB is now placed according to the marks on the photodiode PCB, and the 4 connections of the radial coils are soldered before the connections A and B.

PCB'en placeres på plads under fotodioden PBC'en, og hver enkelt tilslutning varmes let op med en loddekoble, til lodningerne løber sammen.

Now the PCB is placed correct below the photodiode PCB, and the 6 connections C can now be heated so that they become soldered to the photodiode PCB.

For montering af RAFOC enheden, se afsnittet om servicering af RAFOC enhed.

For mounting the RAFOC unit, see section concerning servicing the REFOC unit.

Udskiftning af focus enhed pos. 9604
De 2 tilslutninger fra fleks PCB'en til focus enheden loddes fra.

Skruen der holder focus enheden skrues ud. Bemærk, gevindstykket (pos. 9606) vil gå løs.

Replacing the focusing unit pos. 9604
Desolder the 2 connections of the flex PCB on the focusing unit.

Remove the screw fastening the focusing unit. As a result the fixing piece (pos. 9606) will come loose.

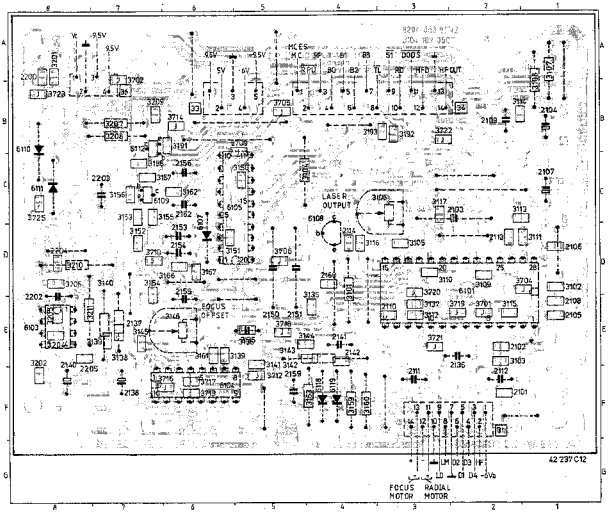
Focus enheden kan nu tages af.

The focusing unit can now be removed.

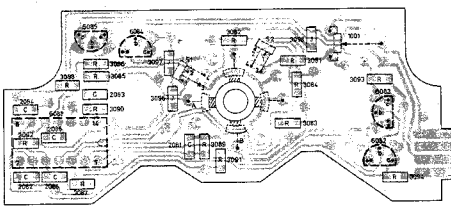
Ved montering af ny focus enhed er placeringen fikseret, og justering er ikke mulig.

When mounting the new focusing unit the position is fixed, adjustments are not possible.

SERVO PCB 30



DISC MOTOR CONTROL



Kontrol af laserforsyning

Laseren, laserforsyningen i 30IC6101 og monitordioden danner et tilbagekoblings system. En fejl i laserforsyningen kan medføre at laseren ødelægges.
Hvis dette er tilfældet, og laseren (= komplet RAFOC enhed) udskiftes, vil den nye laser også ødelægges.

Da det er umuligt at kontrollere og reparere et tilbagekoblingssystem hvor en af komponenterne mangler, kan nedenstående kredsløb bruges til at kontrollere laserforsyningen.

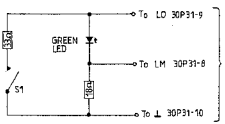
Den grønne LED udgør laseren. Spændingen over 18 ohms modstanden udgør monitor tilbagekoblings spændingen. 33 ohms modstanden og omskifteren gør det muligt at ændre strømforbruget fra laserforsyningen.

Check of laser supply

The laser and the laser supply in 30IC6101 plus the monitor diode form a feedback system. A defect in the laser supply may result in the destruction of the laser.
If, in that case, the laser (= complete RAFOC unit pos. no. 9607) is replaced, the new laser will also become defective.

However, it is impossible to check and repair a feedback system if a link is missing. For this reason the laser supply can be checked with the circuit below.

The green LED replaces the laser, the voltage across the 18-Ohm resistor is fed back as monitor voltage, the 33-Ohm resistor and the switch serve to draw more current from the laser supply.



Grøn LED f.eks. CQY94 bestillings. nr. 8330054.

Fleks printet tages ud af P31 på servo PCB'en.

Ovenstående kredsløb loddes på P31 på servo PCB'en.

$\overline{SI}$ (ben 20 på 30IC6101) kortsluttes til stel.

Når $\overline{SI}$ (Start initialization) er low, kan laserforsyningen tændes i service position 1. Sæt apparatet i serviceposition 1. (Kortslut service stikket på PCB5 samtidig med at netstikket sættes i).
Tryk derefter OPEN og PLAY samtidigt.

LO spændingen på 30P31 ben 9 måles.

S1 afbrudt: LO fra 1,8 V til 2,3 V
LM fra 170 mV til 220 mV
Den grønne lysdiode lyser svagt.

S1 kortsluttet: LO fra 1,8 V til 2,3 V
LM fra 170 mV til 220 mV
Den grønne lysdiode lyser svagt.

Når S1 skiftes fra kortsluttet til afbrudt vil LED'en lyse kraftigere i et kort øjeblik. Tilbagekoblingssystemet bevirker at der går samme strøm i LED hvadenten S1 er kortsluttet eller afbrudt.

LED green e.g. CQY94 part no. 8330054.

Take the flex PCB out of P31 on the servo PCB.

Connect above mentioned circuit to P31 on the servo PCB.

Connect $\overline{SI}$ (pin 20 of 30IC6101) to ground.

With $\overline{SI}$ (start initialization) low, the laser supply can be switched on. Put the player in service position 1. (Short circuit service plug on PCB5 and plug into mains supply at the same time).
Then press OPEN and PLAY simultaneously.

Measure the voltage LO at 30P31 pin 9.

S1 open: LO from 1.8 V til 2.3 V
LM from 170 mV to 220 mV
The green LED emits little light.

S1 closed: LO from 1.8 V to 2.3 V
LM from 170 mV to 220 V
The green LED emits little light.

During the change over from S1 closed to S1 open, the LED will emit more light for a short moment. The control sees to it that the same amount of current flows through the LED when S1 is open and when S1 is closed.

Justering af laserstrøm

Bemærk! Ved udskiftning af RAFOC enheden (pos. nr. 9607) skal laser current potentiometeret (pos. nr. 30R3106) stilles i mekanisk midt position for at undgå beskadigelse af laseren.

Tilslut DC voltmeter over 30R3102.

Ilæg testplade nr. 5 (plade uden fejl, bestillingsnr. 3634031).

Sæt apparatet i serviceposition 2. (Kortslut servicestikket på PCB5 samtidig med at netstikket sættes i). Tryk derefter OPEN og PLAY samtidigt 2 gange.

Juster 30R3106 indtil spændingen over 30R3102 er ca. 40 mV.
(Spændingen varierer hvis pladen roteres).

Gå ud af serviceposition 2 ved at afbryde netspændingen kortvarigt.

Afspil spor 1 på testplade 5.

30R3106 justeres indtil spændingen over 30R3102 er 50 mV ±5 mV.

Adjusting the laser current

Attention: When exchanging the RAFOC unit (pos. nr. 9607), the laser output potentiometer (pos. nr. 30R3106) should be placed in mechanical mid-position to avoid damage to the laser.

Connect CD voltmeter across 30R3102.

Put test disc no. 5 (disc without defects part no. 3634031) on the turntable.

Put the player in service position. (Short circuit the service plug on PCB5 and plug into mains supply at the same time).
Then press OPEN and PLAY simultaneously and twice.

Adjust 30R3106 until the voltage across 30R3102 is about 40 mV.
(This voltage varies when the disc is rotated).

Leave service position 2 by switching of the mains briefly.

Play track 1 of test disc 5.

Adjust 30R3106 until the voltage across 30R3102 is 50 mV ±5 mV.

Kontrol af disc motor systemet

1. Afbryd Vc forbindelsen ved at lodde 30D6110 og 30D6111 fra.
2. Tilslut den ene kanal på et dobbelt strålet oscilloskop til emitteren på 96TR6082, og den anden kanal til emitteren på 96TR6084. Indstil oscilloskopet til 2V – 10 mS.
3. Sæt apparatet i serviceposition 1. (Kortslut service stikket på PCB5 samtidig med at netstikket sættes i).
   Tryk derefter OPEN og PLAY samtidigt.
4. Tilslut en negativ DC spændingsforsyning (V-in) til 30P36-1. NB! Apparatet *skal* stå i service position 1 (strømforsyningen i apparatet skal være tændt) når dette gøres.

   Start fra 0 V og reguler DC forsyningen mod – indtil motoren kører (max. -5 V).

   Når motoren kører, ændres spændingen til -1,5 V.

   Motoren skal stadig køre.

Check of disc motor system

1. Interrupt the Vc connection by desoldering 30D6110 and 30D6111.
2. Connect channel A of a dual-beam oscilloscope to the emitter of transistor 96TR6082 on the motor PCB and channel B to the emitter of transistor 96TR6084. Position of the oscilloscope: 2 V/div – 10 ms/div.
3. Put the player in service position 1. (Short circuit the service plug on PCB5 and plug into mains supply at the same time).
   Then press OPEN and PLAY simultaneously.
4. Inject a *negative* voltage (V-in) to pin 1 of 30P36. This voltage *may only* be injected *after* the player is put in service position 1. (The power supply in the player must be ON).

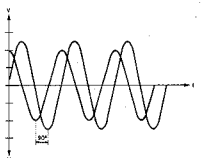
   Start from 0 V and lower this voltage fast until the motor is running (max. -5 V).

   When the motor is running, the voltage can be reduced to -1.5 V.

   The motor should keep on running.

5. Sinus signaler (V-out) skal nu være synlige på oscilloskopet. Efter ca. 2 sek. skal signalerne ligge symmetrisk omkring 0 V, og være 90° faseforskudt (se tegning).
Størrelsesforholdet mellem de 2 signaler må højst være 1:2.

5. Now sinusoidal signals (v-out) should be present on the oscilloscope (see figure) which, after about 2 seconds, lie symmetrically round the 0-axis and have shifted 90° in phase relative to one another. The amplitudes of these 2 signals have a maximum permissible ratio of 1:2.



6. Amplituden er afhængig af størrelsen af den tilførte DC spænding.
Forholdet V-in/V-outpp skal ligge mellem 1:2 og 1:3.

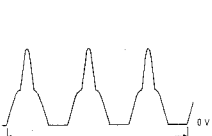
6. The amplitude is dependent on th injected voltage. The ratio V-in/V-outpp should lie between 1:2 and 1:3.

7. DC spændingsforsyningen (V-in) ændres indtil motoren kører 600 omdr. min. (V-out frekvens = 30 Hz).
V-in skal ligge mellem -1,5 V og -3,7 V med 600 omdr. min.

7. Now adjust V-in until the motor rotates 600 r.p.m. At 600 r.p.m. the frequency of V-out is 30 Hz. V-in should lie between -1.5 V and -3.7 V at this speed.

8. Mål med oscilloskop, først over 96R3094, og derefter over 96R3093 på disc motor control PCB'en. De 2 stråler på et dobbelt stråret oscilloscop *må ikke* tilsluttes over de 2 modstande samtidig, da forsyningsspændingerne ellers kortsluttes.
Spændingsforsyningen reguleres, indtil der ses 3 pulser med oscilloskopet på 100 mS. (se tegning).

8. Measure with an oscilloscope first across 96R3094 and hereafter across 96R3093 on the disc motor PCB. DO not measure across both resistors at the same time, as this will cause short circuit of the power supplies.
Now adjust the injected voltage in such a way that 3 complete pulses are visible during 100 mS. (See figure).



Oscilloskopet polariseres sådan, at pulserne vender som vist.

The polarity of the oscilloscope must be chosen so that the tops of the pulses are in upward position.

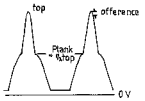
9. DC spændingsforsyningen reguleres til -1,7 V ±0,5 V på P36-1 på servo PCB'en.

   Reference spænding over 96R3094 = 56,4 mVpp.
   Reference spænding over 96R3093 = 58,8 mVpp.
   Hvis forskellen på de 2 spændinger er større end 6 mV, når spændingerne er lavere end reference værdierne, er motoren defekt.

9. Adjust the injected voltage until -1.7 ±0.5 V are present on pin 1 of P36 on the servo PCB.

   Reference voltage across 96R3094 = 56.4 mVpp.
   Reference voltage across 96R3093 = 58.8 mVpp.
   If the difference of the 2 voltages exceeds 6 mV, while the voltages are below the reference values, the motor is defect.

10



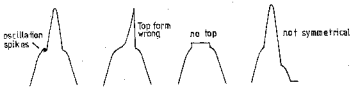
10

Toppen må højest variere 24 mV i amplitude.
Flanken må højest variere 36 mV i amplituden.

Top difference must not exceed 24 mVpp amplitude.
Flank difference must not exceed 36 mVpp amplitude.

11. Eksempler på pulsformer som er udtryk for fejl i disc motor systemet.

11. Examples of wave forms when the disc motor system is faulty.



12. DC spændingsforsyningen reguleres til -1,5 V på P36-1 på servo PCB'en.
   Motoren skal stadig køre.
   Pulsens amplitude falder, men pulsformen skal stadig være symmetrisk og afrundet.

12. Adjust the injected voltage until -1.5 V are present on pin 1 of P36 on the servo PCB.
   The motor should keep on running
   The amplitude of the pulse will be lower, but the wave form has to be symmetrical and rounded.

Konklusion:

Hvis ovennævnte punkter kan opfyldes, er disc motor systemet i orden.

Conclusion:

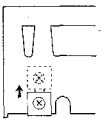
When all above mentioned conditions are fulfilled it may be assumed that the disc motor system is all right.

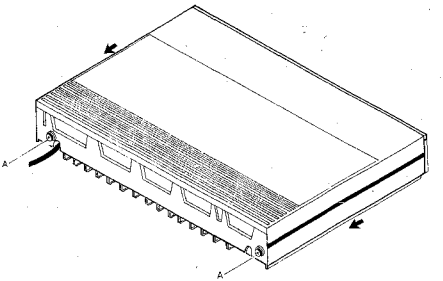
ADSKILLELSE

Transportsikring

Før brug fjernes de to transportskruer i bunden, og placeres som beskrevet på bunden.

Kabinet

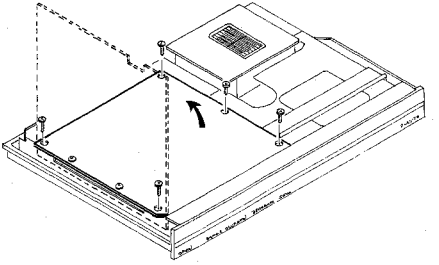




Skruerne (A) løsnes, skubbes op og spændes.

Kabinettet presses ca. 1 cm. bagud, og løftes af.

PCB



De 5 skruer fjernes.

PCB stilles i service position som vist.

DISASSEMBLY

Transport protection

Before use remove the two transport screws on the base and insert them as described on the base.

Cabinet

Loosen, push up and tighten screws (A).

Press the cabinet approx. 1 cm to the rear and lift off.

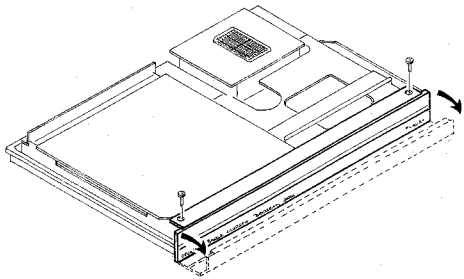
PCB

Remove the five screws.

Place the PCB in service position as shown.

Frontpanel

Front panel



Afmonter de to viste skruer

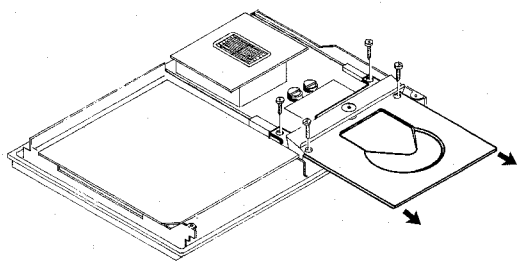
Vip frontpanelet frem.

Remove the two screws as shown.

Tip the front panel forwards.

Disc skuffe

Disc tray



Afmonter de fire viste skruer.

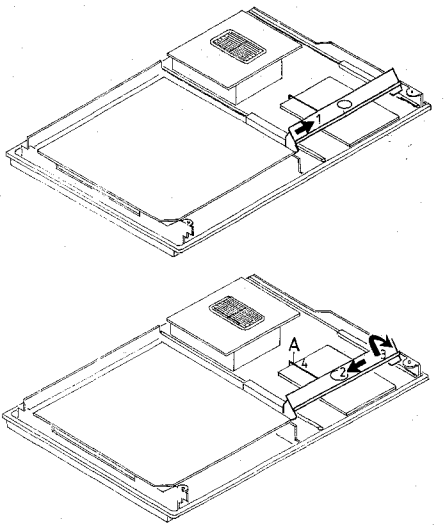
Træk forsigtigt skuffen ud.

Remove the four screws shown.

Pull out the drawer carefully.

Disc holder

Disc holder



Skuffen skal stå i »OPEN« position.

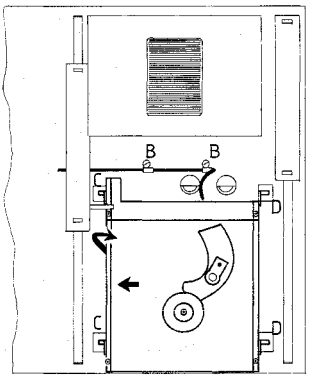
1. Disc holderen vippes af plastakslen i venstre side.
2. Disc holderen vippes af plastakslen i højre side.
3. Disc holderen drejes i pilens retning.
4. Metalarmen (A) kan derefter trækkes af.

The disc tray must be placed in 'OPEN' position.

1. Tip the disc holder off the plastic shaft in the left side.
2. Tip the disc holder off the plastic shaft in the right side.
3. Carefully turn the disc holder in the direction of the arrow.
4. Carefully pull off the metalholder (A).

Løbeværk

CD mechanism



1. De to ledningsholdere (B) drejes med uret
2. De to plastflige (C) i bundpladen til venstre for løbeværket presses ned. Samtidig presses løbeværket mod venstre.
3. Løbeværket kan derefter forsigtigt løftes op i venstre side.
4. Til sidst trækkes løbeværket forsigtigt fri af de to holdere (D) i højre side.

NB! Undgå at trække i selve løbeværket, da det er fastgjort i gummistykker.

Vær også opmærksom på flexprintet mellem løbeværk og servo.
Undgå at udsætte dette flexprint for skarpe bøjninger.

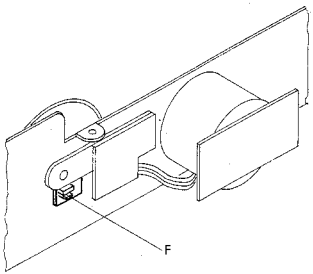
1. Turn the two leadholders (B) clockwise.
2. Push the two plastic tags (C), which are placed in the bottom plate on the left af the CD mechanism, down. Simultaneously push the mechanism to the left.
3. Now carefully lift off the mechanism in the left side.
4. After that the mechanism can be pulled off the lead holders (D) in the right side.

NOTE! Avoid pulling the mechanism itself, as it is hanging in four rubber pieces.

Be aware of the flex PCB between the mechanism and the servo.
Avoid bending this PBC sharply.

Snorhjul pos nr. 9014

Cord pulley Pos. no. 9014



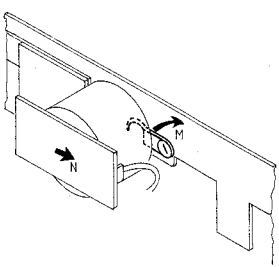
Plastfligen (F) presses op.

Træk snorhjulet af akslen.

Push the plastic tag (F) upwards.
The cord pulley can now be pushed off the shaft.

Skuffemotor pos. nr. 06M1

Tray motor Pos. no. 06M1



Plastkrogen (M) drejes op.

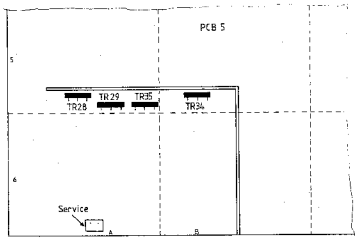
Skyd skuffemotoren ud af holderen i pilen's retning (N).

Turn the plastic hook upwards. (M)

The cord pulley can now be pushed out in the direction of the arrow (N)

REPARATIONSTIPS
Serviceprogram
Kortslut servicestikket på PCB5, samtidig med at netstikket sættes i.

REPAIR HINTS
Service program
Short-circuit the service plug on PCB5 and plug into mains supply at the same time.



Tast OPEN og PLAY samtidigt	Display indikerer serviceposition 1.	
Press OPEN and PLAY simulta-neously	Display indicates service position 1.	
Tast PLAY	Laserarm svinger ud.	*Hvis arm bliver stående:* Er fleks-PCB rigtigt placeret? Går radialspole imod? Er trægheden i armlejet for stor?
Press PLAY	Laser arm swings out.	*If arm doesn't move:* Is flex-PCB placed correctly? Does radial coil touch? Is arm bearing inertia excessive?
Tast OPEN	Laserarm svinger ind.	*Hvis arm bliver stående:* Er fleks-PCB rigtig placeret? Går radialspole imod? Er trægheden i armlejet for stor?
Press OPEN	Laser arm swings in.	*If arm doesn't move:* Is flex-PCB placed correctly? Does radial coil touch? Is arm bearing inertia excessive?
Ilæg CD-plade Load compact disc		
Tast OPEN and PLAY samtidigt	Display indikerer 2. Laser tænder og søger focus. Hvis display indikerer 2 konstant: Focussøgning i orden.	*Hvis 2 i displayet blinker:* CD bliver ved med at søge i focus, indtil der tastes OPEN og PLAY samtidigt. Tændes laser? Regulerer FE-udgangen til focus motoramplifier? Regulerer focusmotor?

Oversigt over IC ben

Nedenstående skemaer er en kort beskrivelse af funktionen af de vigtigste ben på servo og decoder IC'erne.
De steder hvor 2 IC'er har direkte forbindelse med hinanden, er der kun nævnt benet på den ene IC.

IC pin survey

The following surveys shortly describes the function of the most important pins of the servo and decoder IC's.
Where 2 IC's are directly connected only one pin is mentioned

5IC6 MAB 8441

PIN	BEMÆRKNINGER/REMARKS	PLAY POSITION	SERVICE POSITION 1	SERVICE POSITION 2	SERVICE POSITION 3	SERVICE POSITION 4	SEARCH POSITION
21	$\overline{SI}$ (Start Initialization). Når $\overline{SI}$ er »low«, er laserforsyningen og focus styring tændt. When $\overline{SI}$ is 'low' the laser supply and the focus control are switched on.	»Low«	»High«	»Low«	»Low«	»Low«	»Low«
7	RD (Ready). Med plade på pladeholderen vil RD forblive »high« når focuspunktet er fundet. With a disc on the turntable, RD stays 'high', when the focal point has been found.	»High«	»Low«	»High«	»High«	»High«	»High«
20	$\overline{SSM}$ (Motor Start-Stop signal). Når RD er gået »high«, vil $\overline{SSM}$ være »high« i et kort øjeblik (<0,2 sek.), og discmotor forstærkeren tændes (styret af MCES signalet). When, after RD 'high', the $\overline{SSM}$ is high for a short moment (<0.2 sec.), the disc motor amplifier will be switched on (controlled by the MCES signal).	136 µS	»Low«	»Low«	136 µS	136 µS	136 µS
8	B0 Tænder radial kontrol. Styrer niveauet på radial servo DAC udgang. I søge position vil der være aktivitet på alle 4 udgange.	»High«	»Low«	»Low«	»Low«	»High«	»Activity«
9	B1	»High«	»High«	»High«	»High«	»High«	»Activity«
10	B2 Switches the radial control on. Controls the level on the radial servo DAC output. In search mode, there should be activity on all 4 pins.	»High«	»High«	»High«	»High«	»High«	»Activity«
11	B3	»Low«	»Low«	»Low«	»Low«	»Low«	»Activity«
12	$\overline{TL}$ (Track Loss). $\overline{TL}$ giver information til 5IC6 om at tab af spor kan være forestående. 5IC6 kan så give korrektionssignaler med B0-B3. $\overline{TL}$ tells 5IC6 that track loss treatens. 5IC6 can give correction signals with B0-B3	»High«	»High«	»Low«	»Activity«	»High«	»Activity«
13	RP (Radial Position). RP bestemmer laserarmens position i forhold til sporet, og korrigerer ved spring over spor og ved mekaniske stød mod apparatet. RP determines the position of the arm relative to the track and to check/correct in case of track jumping or bumping against the player				»Activity«		»Activity«
22	$\overline{DODS}$ (Drop Out Detector Suppression). Når $\overline{DODS}$ er »low«, har drop out signaler ingen indflydelse på styringen af laserarmen under søg. When $\overline{DODS}$ is 'low' drop out signals do not influence on the arm control during track jumping.	»High«	»Low«	»Low«	»Low«	»High«	»Activity«
6	$\overline{RPU}$ (Radial Pulse). RPU aflader 30C2156 under søg. 30IC2156 virker som hukommelse for stigningsgraden på pladen. During search, $\overline{RPU}$ clears 30C2156. 30C2156 memorizes the degree of inclination of the disc.	»High«				»High«	»Activity« 0.1 mS/ Div.

7-2

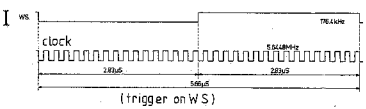
7-2

Press OPEN and PLAY simultaneously	Display indicates 2. Laser switches on and searches for focus If display indicates constant 2: Focus search is OK.	*If 2 in the display flashes:* CD continues searching for focus until OPEN and PLAY are pressed simultaneously. Does laser switch on? Does FE output controlling focus motor amplifier regulate? Does focus motor regulate?
Tast OPEN og PLAY samtidigt Press OPEN and PLAY simultaneously	Display indikerer 3. CD-motor starter rotation og laser placeres mod centrum. Display indicates 3. CD motor starts rotation, and the laser is positioned towards the centre.	*Hvis CD-plade ikke roterer:* Starter RD-udgangen turntable motoramplifier? Er MCES-pulsen tilstede? *If compact disc doesn't rotate:* Does RD output start the turntable motor amplifier? Is MCES pulse present?
Tast OPEN og PLAY samtidigt Press OPEN and PLAY simultaneously	Display indikerer 4. Radialsøgning startes. Hvis display indikerer 4 konstant. Radial søgning i orden. Display indicates 4. Radial search is started. If display indicates constant 4. Radial search is OK.	*Hvis 4 i displayet blinker:* Regulerer RE-udgangen til radial motoramplifier? Subcode info er ignoreret. Musik kan høres, fordi MUSB er høj men er afhængig af lead-in sporets længde. Kan vare op til 1 min. *If 4 in the display flashes:* Does RE output controlling radial motor amplifier regulate? Subcode info has been ignored. Music is audible because MUSB is high but dependet on length of lead-in track. May last up to 1 minute.
Tast PLAY Press PLAY	Display forbliver i 4 konstant. Laserarm springer ud over spor. Display remains in 4 constantly. Laser arm jumps out across tracke.	*Hvis 4 i displayet blinker:* Kontroller radialservo. *If 4 in the display flashes:* Check radial servo.
Tast OPEN Press OPEN	Display forbliver i 4 konstant. Laserarm springer ind over spor. Display remains 4 constantly. Laser arm jumps in across tracks.	*Hvis 4 i displayet blinker:* Kontroller radialservo. *If 4 in the display flashes:* Check radial servo.
Serviceprogrammet kan gentages ved at taste OPEN og PLAY samtidigt. Displayet indikerer da kort efter serviceposition 1. Serviceprogrammet afsluttes ved kortvarigt at fjerne netstikket.		The service program can be repeated by pressing OPEN and PLAY simultaneously. The display will shortly afterwards indicate service position 1. The service program is terminated by briefly disconnecting the mains supply.

PIN	BEMÆRKNINGER/REMARKS	PLAY POSITION	SERVICE POSITION 1	SERVICE POSITION 2	SERVICE POSITION 3	SERVICE POSITION 4	SEARCH POSITION
28	CRI (Counter Reset Inhibit). CRI er »low« ved spring over spor. CRI is 'low' in case of track jumping.	»High«				»High«	»Activity«
32	DEEM (Deemphassis). »Low« ved afspilning af testplade 5A spor 14. »High« ved afspilning af testplade 5A spor 15. 'Low' when playing test disc 5 track no. 14 'High' when playing test disc 5 track no. 15						
19	OSC. Indgang fra krystal oscillator. Input from crystal oscillator	11.28 MHz	11.28 MHz			11.28 MHz	
11	$\overline{\text{MUTE}}$. Muter audio signalet Mutes the audio signal	»High«				»High«	»High«
22	PD/OC (Phase Detector/Oscillator Control). Pulser fra fasedetektorens udgang integreres og regulerer oscillatorfrekvensen. Pulses from the output of the phasedetector are integrated and controls the oscillatorfrequency.						
23	IREF. Strøm reference til fasedetektoren. Current reference for the phasedetector.						
24	FB (Feed Back). Fastholder data slicerens arbejdspunkt. Keeps the operating point for the data slicer.						

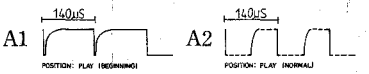
5IC9 SAA 7220

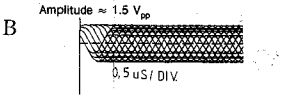
PIN	BEMÆRKNINGER/REMARKS	PLAY POSITION	SERVICE POSITION 1	SERVICE POSITION 2	SERVICE POSITION 3	SERVICE POSITION 4	SEARCH POSITION
18	WS (Word Select)	I	I	I	I	I	I
16	Clock						
15	Data	»Activity«	»Stable«	»Stable«	»Stable«	»Activity«	»Activity«
22	$\overline{\text{ATSB}}$ (Attenuation Audio Signal). Ved »low« dæmpes signalet 12 dB. When 'low', the signal is lowered with 12 dB						
23	$\overline{\text{MUSB}}$ (Soft Mute). $\overline{\text{MUSB}}$ er »low« ved spring fra et spor til et andet. *Vil være »high« ved søgning i serviceposition 4. $\overline{\text{MUSB}}$ is 'low' when jumping from one track to another. *Will be 'high' when using search in service position 4.	»High«				»High«	*»Low«
14	DOBM (Digital Output). Fejlkorrigeret audio og subcode data. Error corrected audio and subcode data.						

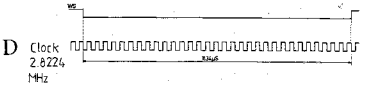


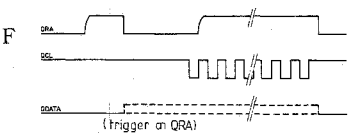
5IC7 SAA7210

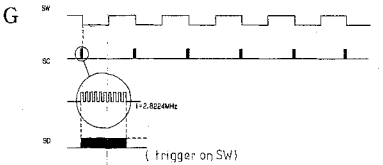
PIN	BEMÆRKNINGER/REMARKS	PLAY POSITION	SERVICE POSITION 1	SERVICE POSITION 2	SERVICE POSITION 3	SERVICE POSITION 4	SEARCH POSITION
17	MCES (Motor Control). MCES styrer discmotorens hastighed. MCES controlls the turntable motor speed.	A_1/A_2	A_2	A_2	A_1/A_2	A_1/A_2	A_1/A_2
25	HF (High Frequency). Indgang for HF øje mønster. *Efter lead-in er læst HF eye pattern input. *After lead-in has been read.	B (Stable)			B (Unstable)	B* (Stable)	»Activity«
26	HFD (High Frequency Detector). HFD vil gå »low« når HF signalet er for svagt. *Ved afspilning af testplade 5A, vil HFD give »low« pulser på spor med afbrydelser og sorte pletter. HFD will go 'low' when the HF signal is too low. *When playing test disc 5A, track numbers with interruption or black dot, HFD will make low pulses.	»High«*				»High«	»Activity«
27	CEFM. Spændings kontrolleret oscillator udgang. *Hvis pladen bremses forsigtigt med hånden, vil oscillator frekvensen falde. CEFM. Voltage controlled oscillator output. *When the disc is slowly bracked by hand, the oscillator will lower its frequency.	4.32 MHz*	2.82 MHz	2.82 MHz	4.32 MHz*	4.32 MHz*	4.32 MHz
39	WS (Word Select)	D			D	D	D
38	Clock	D			D	D	D
37	Data	»Activity«				»Activity«	»Activity«
36	E Flag (Error Flag). Indikerer utroværdige samples for 8 sample interpolator. Indicates untrustworty samples for 8 sample interpolator.						»Activity«
30 31 29	QRA (Q-channel Request Acknowledge). QCL (Q Clock). QData QRA initieres af 5IC6 med »high«, 5IC7 svarer med »low«. Ved forkanten på næste clock puls sættes QRA »high« igen af 5IC6. Når 5IC6 har modtaget nok information (via Q Data), går QRA »low«. Dette gør at QRA tiden varierer. QRA is initiated by 5IC6 with 'high', 5IC7 answers with 'low'. With the next leading clock (Q CL) the QRA is set 'high' again by 5IC6. When 5IC6 has taken enough information (via Q Data), QRA will go 'low'. This makes the QRA times vary each time.	F F F				F F F	
33 35 34	SW (Subcode Word clock). SC (Subcode Clock). SD (Subcode DATA) Efter Motor Start Pulse vil Subcode Word Clock være synlig. Medens en burst på 10 clock pulser er synlig på SC, overføres Q-channel information på SD. Herefter følger P-bit indikation. P-bit indikationen kommer mellem 2 bursts på 10 clock pulser. Ved pause er P-bit indikationen »high« og ved musik er den »low«. After Motor Start Pulse, Subcode Word Clock is visible. While the burst of 10 clock pulses appear on SC, the Q-channel information is transferred on SD. Hereafter the P-bit indication follows. The P-bit is 'high' between two bursts of 10 clock pulses in case of pause indication, and 'low' in case of music indication.	G			G	G	











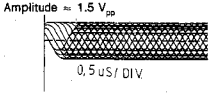
30IC6102 TDA 5709

PIN	BEMÆRKNINGER/REMARKS	PLAY POSITION	SERVICE POSITION 1	SERVICE POSITION 2	SERVICE POSITION 3	SERVICE POSITION 4	SEARCH POSITION
10	DAC (Digital to Analogue Converter). DAC styrer hastigheden på spring over spor. Signalet er genereret af B0-B3. *Når man banker forsigtigt på apparatet vil der være aktivitet. DAC controls the track jumping speed. The signal is derived from the signals B0-B3. *Knock carefully on the set, and there should be activity.	*			»Low«	*	»Activity«
7	RE (Radial Error). RE holder lyspletten på sporet. *En 650 Hz sinus vil være synlig i RE signalet. RE keeps the light spot on track. *A 650 Hz sine wave should be visible in the RE signal.	*				*	
8	RE lag (Radial error for lag network). 30C2156 i RE lag kredsløbet har en hukommelsesfunktion. Den husker stigningsgraden på pladen. Når der springes til et givet spor på pladen, skal denne hukommelse tømmes. Det gøres med 5IC6 via 30TR6109. *En 650 Hz sinus vil være synlig i RE lag signalet. 30C2156 in the RE lag circuit has a memory function. It memorizes the degree of inclination on the disc. When a jump is made to a certain track on the disc, the memory should be cleared. This is done by 5IC6 via 30TR6109. *A 650 Hz sine wave should be visible in the RE lag signal.	*				*	
4	D factor. (Offset control). Typical 0V	Min.Gain -2.5V	+4		-0.5V	-1V/-1.5V	
5	K factor. (Gain control). Typical -1V/-1.5V	Max.Gain -0.5V					

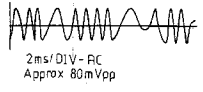
30IC6101 TDA 5708

PIN	BEMÆRKNINGER/REMARKS	PLAY POSITION	SERVICE POSITION 1	SERVICE POSITION 2	SERVICE POSITION 3	SERVICE POSITION 4	SEARCH POSITION
17	LO (Laser Out).	»High«	»Low«	»High«	»High«	»High«	»High«
16	LM (Laser Monitor) Via LM styres strømforsyningen til laser dioden. Via the LM the power supply for the laser diode is controlled.	200 mV ±50 mV		200 mV ±50 mV			
5	FE (Focus Error). FE styrer focus enheden. Når SI går »high« søges der efter focus punktet. Når apparatet sættes i serviceposition 2 uden plade, vil optikket søge efter focus punktet. På ben 5 vil FE signalet variere mellem 0 V og +4 V. FE drives the focusing unit. When the SI goes 'high', the focal point will be searched for. When the player is brought into servicing position 2 without disc, the objective will search for the focal point. At pin 5 the FE signal varies between 0 V and +4 V.						
9 10 8 7	D1 D1–D4 er korrektionssignaler for fotodiode kredsløbet. Hvis pladen bevæges når apparatet er i serviceposition 2, skal focusenheden holde focus. D2 Når pladen bevæges, skal der være varierende signaler på ben 7, 8, 9 og 10. D3 D1–D4 are the error signals from the photodetector circuits. When in servicing position 2 the disc is moved, the focusing unit should keep the laser D4 beam in focus. When the disc is moving, there should be a changing signal on pin 7, 8, 9, 10.						
3	HF (High Frequency). HF information fra de 4 fotodioder. HF information from the 4 photodiodes.						
27	HF out (High Frequency out). HF out er et forstærket informationssignal til decoderen. *Efter lead-in er læst. HF out is the amplified information signal for the decoder. *After lead-in has been read.	B (Stable)			B (Unstable)	B* (Stable)	
26 19 18	DET (Detector). HFD (High Frequency DETECTOR). TL (Track Loss). DET giver information om HF signalets niveau til niveau/drop-out detektoren i 30IC6101. Når HF signalets niveau er for lavt, vil HFD gå »low«. TL vil så gå »low« som information til 5IC6 om at sporings signalerne er upålidelige. DET gives information on the level of the HF signal to the level/drop-out detector in 30IC6101. When the level of the HF signal is too low, HFD will go 'low'. TL will then go 'low' in order to tell 5IC6 that the tracking signals are unreliable.						
11 12	RE1 (Radial Error). RE1-2 er styresignaler til sporing af laseren. RE2 RE1-2 are the control signals for the arm during tracking.					J	
25	SC (Start Capacitor). *Stiger til +5 V hvis focus punktet er fundet. *Rises to +5 V if focus point is found.		-5 V	*	+5 V	+5 V	
6	FE lag (Focus Error). *Når pladen bevæges, vil signalet variere. *When the disc is moved by hand, the signal will vary.			*	Approx. 100 mVpp		
13	AGC. *Ved maksimum HF signal ≤-400 mV. Ved ingen HF signal +5 V. *At maximum HF signal ≤-400 mV. At no HF signal +5 V.	*	»High«	»High«	*	*	

B

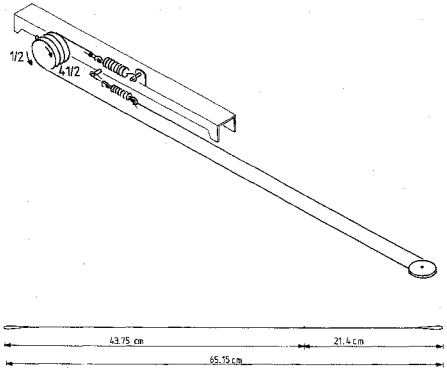


J



Snortræk

Cord drive

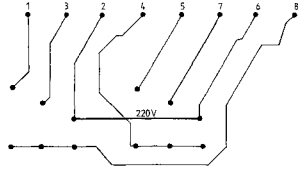


7-9

NETSPÆNDINGSVARIANTER AF TRANSFORMATOR 8005169

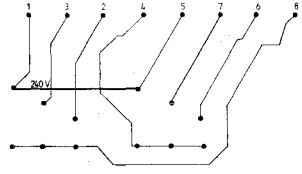
MAINS VOLTAGES FOR TRANSFORMER 8005169

220 V:



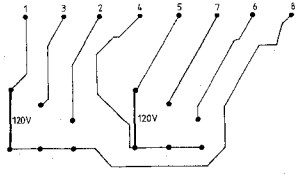
Seen From Copperfoil Side

240 V:



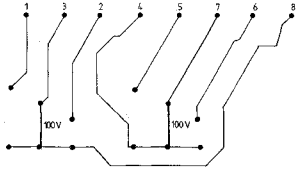
Seen From Copperfoil Side

120 V:



Seen From Copperfoil Side

100 V:



Seen From Copperfoil Side

5IC4 MAB 8461

PIN	BEMÆRKNINGER/REMARKS	PLAY POSITION	SERVICE POSITION 1	SERVICE POSITION 2	SERVICE POSITION 3	SERVICE POSITION 4	SEARCH POSITION
1	DATA LINK Data bus for betjening i forbindelse med Beomaster/Beocenter. Data bus for control in connection to Beomaster/Beocenter.						
2 3	I^2C DATA I^2C DATA og CLOCK for system kontrol. I^2C CLOCK I^2C DATA and CLOCK for system control.	»Activity«	»Activity«	»Activity«	»Activity«	»Activity«	
12	TRAY POSITION Information til 5IC4 om pladeskuffens øjeblikkelige position ved ind og ud transport, hvorefter ben 4, 5, 6, 7 og 8 kan bestemme hastigheden.						
4 5 6 7 8	TRAY / SPEED Information to 5IC4 about the instant position of the CD tray when moving in or out, where upon pin 4, 5, 6, 7 and 8 determines the speed.						
9 10	TRAY IN Bestemmer om pladeskuffen skal gå ind eller ud. TRAY OUT Determines whether the CD tray moves in or out.						
20 21	TRAY IN Information til 5IC4 om pladeskuffen er inde eller ude. TRAY OUT Information to 5IC4 whether the CD tray is in or out.						
22	POWER ON/OFF Tænder og slukker strømforsyningerne til servo og signalbehandlings-kredsløbene. Switches the power supplies to the servo and signal processing circuits on and off.						
24	ENABLE Enable signal til displayet. Enables the display.						
25	MUTE Muter audio signalet. Mutes the audio signal.	»Low«	»Low«	»Low«	»Low«	»Low«	

ISOLATIONSTEST

Når et apparat har været skilt ad, *skal* det isolationstestes. Testen skal udføres, efter at apparatet er blevet samlet igen og er klar til levering til kunden.

Isolationstest for Beogram CD5500

Isolationstesten udføres som følger:
Kortslut de to stikben i netstikket og tilslut en af isolationstestapparatets terminaler. Isolationstestapparatets anden terminal tilsluttes stelbenet i en af phonobøsningerne.

NB!
For at undgå at ødelægge apparatet er det meget vigtigt, at begge isolationstestapparatets terminaler er i virkelig god mekanisk kontakt.

Så drejes isolationstestapparatets spændingsregulator langsomt, indtil man opnår en spænding på 1,5kV. Hold den der i 1 sekund, og skru så langsomt ned for spændingen igen.

Derefter flyttes terminalen fra stelbenet til en skrue i bunden af apparatet.

Så drejes isolationstestapparatets spændingsregulator igen langsomt, indtil man opnår en spænding på 1,5kV. Hold den der i 1 sekund, og skru så langsomt ned for spændingen igen.

Der må på intet tidspunkt i testforløbet forekomme overslag.

INSULATION TEST

Each set *must* be insulation tested after dismantling. The test is to be performed when the set has been reassembled and is ready for delivery to the customer.

Insulation test for Beogram CD5500

Make the insulation test as follows:
Short-circuit the two plug pins of the mains plug and connect one of the terminals of the insulation tester. Connect the other terminal of the insulation tester to the chassis pin of one of the phono bushings.

NB!
To avoid ruining the set, it is essential that both insulator test terminals are in really good mechanical contact.

Now slowly turn the voltage control of the insulation tester until a voltage of 1.5 kV is obtained. Hold it there for 1 second, and slowly turn down the voltage again.

Now move the terminal from the chassis pin to a screw in the bottom of the set.

Then again slowly turn the voltage control of the insulation tester until a voltage of 1.5 kV is obtained. Hold it there for 1 second, and slowly turn down the voltage again.

At no point during the testing procedure any flashovers are permissible.

KREDSLØBSBESKRIVELSE

Indledning

Beogram CD 5500 er en nyudviklet Compact Disc afspiller, der primært er tænkt som en del af Beosystem 5500. Beogram CD 5500 kan naturligvis også tilsluttes og betjenes via Datalink fra andre Bang & Olufsen produkter eller kan tilsluttes forstærkere af andre fabrikater via phonostik.

Beogram CD 5500 er opbygget omkring IC-sættene beskrevet i kredsløbsbeskrivelsen:

Bang & Olufsen Compact Disc
med dekoder IC-sæt SAA 7210
SAA 7220
TDA 1541P
og servo IC-sæt TDA 5708
TDA 5709

Ovennævnte kredsløbsbeskrivelse omhandler dekoder- og servo-kredsløbet. Denne beskrivelse omhandler de øvrige kredsløb i Beogram CD 5500, såsom styring og kontrol, motorkredsløb for CD-skuffe, det analoge filter og digitalt udtag.

Styring/kontrol

Styring af Beogram CD 5500's funktioner foretages af 5IC4 (MAB 8461) og 5IC6 (MAB 8441). 5IC4 varetager den overordnede styring af CD-enheden, hvorimod 5IC6 kontrollerer laserenhedens aftastning af CD-pladen. 5IC6 omtales herefter som servoprocessor.

5IC4 (MAB 8461) er en single-chip 8-bit uC med 6 K ROM/128 RAM bytes og 8-bit LED drive.

5IC6 (MAB 8441) er en single-chip 8-bit uC med 4 K ROM/128 RAM bytes og 8-bit LED drive.

Kommunikationen mellem de to uC'er og display drive IC'en 1IC1 foregår via I^2C bus. Servoprocessoren 5IC6 genererer I^2C clock pulserne og optræder dermed som master på bussen.

Beogram CD 5500 aktiveres via LINK-forbindelsen fra Beomaster/Beocenter eller via tryk på frontpanelet: PLAY eller EJECT.

Netdelen startes op/afbrydes via 5IC4 ben 22 POWER ON/OFF.

Se benoversigt over 5IC4.

Motorkredsløb for CDskuffe

Den principielle virkemåde

Et nyt motorstyringsprincip for CD-skuffen i Beogram CD 5500 har gjort det muligt at mindske CD-skuffens transporttid væsentligt i forhold til andre kendte CD-pladespillere.

CIRCUIT DESCRIPTION

Introduction

The Beogram CD 5500 is a newly developed Compact Disc player which is primarily intended as a constituent of the Beosystem 5500. Of course, the Beogram CD 5500 may also be connected to and operated via Datalink from other Bang & Olufsen products, or it may be connected to amplifiers of other brands via a phono plug.

The Beogram CD 5500 has been designed around the IC sets described in the circuit description:

Bang & Olufsen Compact Disc
with the decoder IC set SAA 7210
SAA 7220
TDA 1541P
and the servo IC set TDA 5708
TDA 5709

The above-mentioned deals with the decoder and servo circuits. This description deals with the other circuits in the Beogram CD 5500, e.g., control and monitoring, motor circuit for CD tray, the analog filter and digital output.

Control/monitoring

The functions of the Beogram CD 5500 are controlled by 5IC4 (MAB 8461) and 5IC6 (MAB 8441). 5IC4 handles the general control of the CD unit whereas 5IC6 monitors laser unit scanning of the CD. 5IC6 will be termed servo processor below.

5IC4 (MAB 8461) is a single-chip 8-bit uC with 6 K ROM/128 RAM bytes and 8-bit LED drive.

5IC6 (MAB 8441) is a single-chip 8-bit uC with 4 K ROM/128 RAM bytes and 8-bit LED drive.

Communication between the two uC's and the display drive IC 1IC1 is effected via the I^2C bus. The servo processor 5IC6 generates the I^2C clock pulses and thus behaves as master on the bus.

The Beogram CD 5500 is actuated via the LINK connection from a Beomaster/Beocenter or by pressing PLAY or EJECT on the front panel.

The power-supply unit is switched on/off via 5IC4 pin 22, POWER ON/OFF.

See also pin survey 5IC4 and 5IC5 in section 7, Service Tips.

Motor circuit for CD tray

Principle of operation

A new motor control principle for the CD tray in the Beogram CD 5500 has permitted a significant reduction in CD tray transport time compared to other recognized CD players.

Adgangstiden (tiden fra PLAY er aktiveret til CD-pladen afspilles) er yderligere nedsat, da indføringen af CD-skuffen og fastholdelse af CD-pladen foregår i samme arbejdsproces. Adgangstiden er ca. 5 sek.

Den kortere transporttid er opnået ved at øge CD-skuffens hastighed. For at CD-skuffen ikke skal køre hårdt imod endestop, reduceres hastigheden langsomt under hele transporten.

Fastholdelse af CD-pladen sker mekanisk.

I forbindelse med CD-skuffen er der monteret en lille metalstang, der ved ind-transport af CD-skuffen griber fast i en plastvinkel på CD-løbeværket. Derved »løftes« løbeværket op, og CD-pladen fastholdes.

Ved at motorstyringskredsløbet kontinuerligt får tilbagemelding om CD-skuffens aktuelle hastighed og position, sikres det, at en øget/ændret friktion ingen indflydelse har på CD-skuffens transporthastighed.

Når CD-skuffen er helt åben eller helt lukket (ved endestop) aktiverer skuffen en kontakt (90S1).

Når CD-skuffen er lukket, skal kontakten være aktiveret før Beogram CD 5500 begynder aftastning af pladen. Derudover anvendes aktivering af kontakten som reference for motorstyringskredsløbet.

Opstår der fejl, så kontakten ikke aktiveres, bliver CD-skuffen ført relativt langsomt ind f.eks. hvis CD-skuffen er blokeret i ud-transport. Aktiveres kontakten heller ikke, når skuffen er lukket, forsøger motorkredsløbet at 'trække' i CD-skuffen igen, hvorefter 'time out' funktionen træder i kraft.

Hvis CD-skuffen er blokeret under ind-transport, kører skuffen lidt ud og derefter forsøge at køre ind igen. Dette gentages, hvorefter CD-skuffen forbliver ude, indtil 'time out' funktionen træder i kraft.

»Time out« funktionen

I motorstyringskredsløbet for CD-skuffen er der indbygget en 'time out' funktion.

Det betyder:

- Når der ikke er fejl på apparatet lukker CD-skuffen automatisk efter 3 min, hvis PLAY ikke er aktiveret forinden.
- Ved fejl forsøger CD-skuffe motorkredsløbet at lukke/'trække' skuffen ind efter 3 min. Derefter forbliver CD-skuffen ude, og Beogram CD 5500 går i STAND BY.

Access time (the time-lapse from actuation of PLAY till the CD starts playing) has been reduced further because the driving in of the CD tray and clamping of the disc are carried out in one operation. Access time is approx. 5 sec.

The short transport time has been achieved by increasing the speed of the CD tray. The speed is reduced gradually throughout the course of transport in order to avoid the CD tray bumping into the end stop with excessive force.

The disc is clamped mechanically.

A small metal rod is mounted in connection with the CD tray. When the CD tray is driven in, the rod grips a plastic plate on the CD transport mechanism. The transport mechanism is thereby 'lifted', and the disc is clamped.

Continuous feedback to the motor control circuit regarding current speed and position of the CD tray ensures that an increase/change of friction will have no effect on the transport speed of the CD tray.

When the CD tray is completely open or closed (at end stop), the tray actuates a switch (90S1).

When the CD tray is closed, the switch has to be actuated before the Beogram CD 5500 starts scanning the disc. Furthermore, actuation of the switch is used as a reference by the motor control circuit.

If an error occurs which results in the switch not being actuated, the CD tray will be driven in at a relatively low speed, if, for example, the CD tray is blocked while being transported out. Also, if the switch is not actuated when the tray has been closed, the motor circuit tries to 'pull' the CD tray again, and then the 'time-out' function steps in.

If the CD tray is blocked while being driven in, the tray will move out a little and then try to move in again. This is repeated, and then the CD tray remains out until the 'time-out' function steps in.

'Time-out' function

A 'time-out' function is incorporated in the motor control circuit for the CD tray.

This means that:

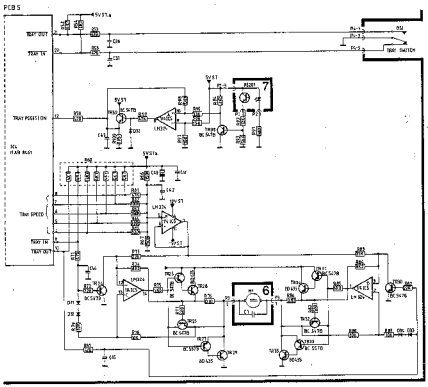
- When there is no error in the product the CD tray will close automatically after 3 minutes unless PLAY is actuated beforehand.
- In case of error, the CD tray motor control circuit will try to close/'pull' in the tray after 3 minutes. Then the CD tray remains out, and the Beogram CD 5500 goes into STAND-BY.

Den elektriske virkemåde

Motorkredsløbet for CD-skuffen består af en D/A-konverter, et forstærkerkredsløb og en optokobler.

Electric operation

The motor circuit for the CD tray comprises a D/A converter, an amplifier circuit and an optocoupler.



Ved hjælp af D/A-konverteren (dannet af 5R6165 og 5IC5b) styrer 5IC4 CD-skuffemotorens hastighed. Niveauet på ben 9 og 10 af 5IC4 angiver CD-skuffens retning.

5IC4 controls the CD tray motor's speed by means of the D/A converter (formed by 5R6165 and 5IC5b). The level at pins 9 and 10 of 5IC4 determines the transport direction of the CD tray.

Motorstyringskredsløbet får tilbagemeldingen fra optokobleren 7PE201.

The motor control circuit receives feedback from the optocoupler 7PE201.

Optokobleren 7PE201's opgave er at informere 5IC4 om CD-skuffens aktuelle hastighed og position under transport.

The optocoupler, 7PE201, has to provide 5IC4 with information on the current speed and position of the CD tray during transport.

Lyset i optokobleren brydes af en tacho-skive. Tacho-skiven er er støbt sammen med en remskive og et snorhjul.

The light in the optocoupler is broken by a tacho disc. The tacho disc is cast together with a belt pulley and a cord pulley.

Remskiven drejes af CD-skuffemotoren. Omkring snorhjulet er der viklet en nylonsnor, hvis ender er fæstnet til CD-skuffen.

The belt pulley is driven by the CD tray motor. A nylon cord with the ends tied to the CD tray is wrapped around the cord pulley.

Tacho-skiven drejer derfor i takt med CD-skuffens bevægelse.

Consequently, the tacho disc rotates in line with the movement of the CD tray.

Ved at 'tælle' impulserne er 5IC4 istand til at beregne CD-skuffens aktuelle hastighed og position. Derved kan 5IC4 tilpasse skuffemotorens hastighed i forhold til CD-skuffens position. Fra endestop til endestop modtager 5IC4 ca. 80 pulser fra optokobleren.

By 'counting' the pulses, 5IC4 is able to calculate the current speed and position of the CD tray. 5IC4 can thus adapt tray motor speed relative to the position of the CD tray. 5IC4 receives approx. 80 pulses from the optocoupler from end stop to end stop.

90S1 aktiveres af CD-skuffen, når skuffen er helt åben eller helt lukket (endestop). Kontakten sluttes normalt ca. 3 sek., efter at PLAY eller EJECT er aktiveret.

90S1 is actuated by the CD tray when the latter is completely open or closed (end stop). The contact is made approx. 3 seconds after PLAY or EJECT has been actuated.

5IC4 kalkulerer med et vist antal impulser fra optokobleren indenfor en bestemt tid. Hvis det forhold ændrer sig væsentligt opfatter 5IC4, at der er fejl i CD-skuffetransporten, og CD-skuffen bliver kørt langsomt ind som omtalt under 'den principielle virkemåde'.

5IC4 expects a certain number of pulses from the optocoupler within a certain period. If that number changes significantly, 5IC4 interprets this as an error in the CD tray transport, and the CD tray is driven in slowly as mentioned under "principles of operation".

Det analoge filter

Det analoge filter er et nyudviklet 3.-ordens Bessel-filter med nulpunkt ved 156.4 kHz. Nulpunktet dannes af et eliptisk filter. Det analoge filter er opbygget uden brug af spoler, hvilket giver en meget lav forvrængning.

The analog filter

The analog filter is a newly-developed 3rd-order Bessel filter with the neutral point at 156.4 kHz. The neutral point is formed by an elliptic filter. The analog filter has been designed without using coils, which results in very low distortion.

Fig. 2a

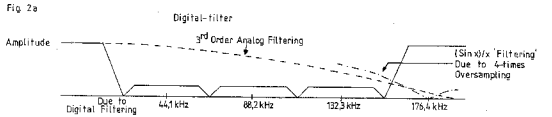
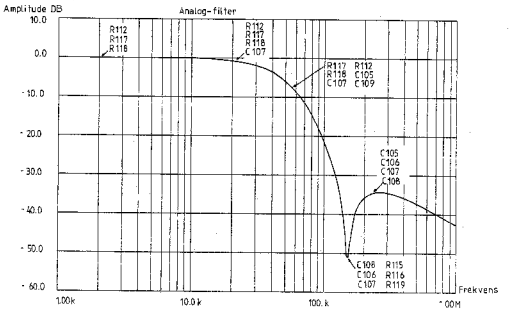


Fig. 2b



Figur 2a viser det digitale filters og et 3.-ordens Bessel-filters indvirkning på frekvenskarakteristikken.

Fig. 2a shows the frequency characteristic from the digital filter and a 3rd-order Bessel filter's influence on the characteristic.

Figur 2b viser frekvenskarakteristikken for det analoge filter med nulpunkt med indikering af de enkelte komponenters arbejdsområde.

Figure 2b shows the frequency characteristic for the analog filter with neutral point, indicating the operating range of the individual components.

Den analoge signaldel og den digitale signaldel forsynes fra hver deres netdel. Derved elimineres risikoen for at overføre støj til den analoge signaldel via forsyningsspændingen.

The analog signal section and the digital signal section are supplied from independent power-supply units. This eliminates the risk of transferring noise to the analog signal section via the supply voltage.

Digitalt udtag

Fra Beogram CD 5500 kan signalet udtages via phono-bøsningen D-OUT i digital form. Signalet tages fra 5IC9 (SAA 7220) ben 14. 5IC9 og D-OUT bøsningen er galvanisk adskilt. Det digitale signal indeholder foruden det fejlkorrigerede og filtrede audiosignal også subkode-informationer.

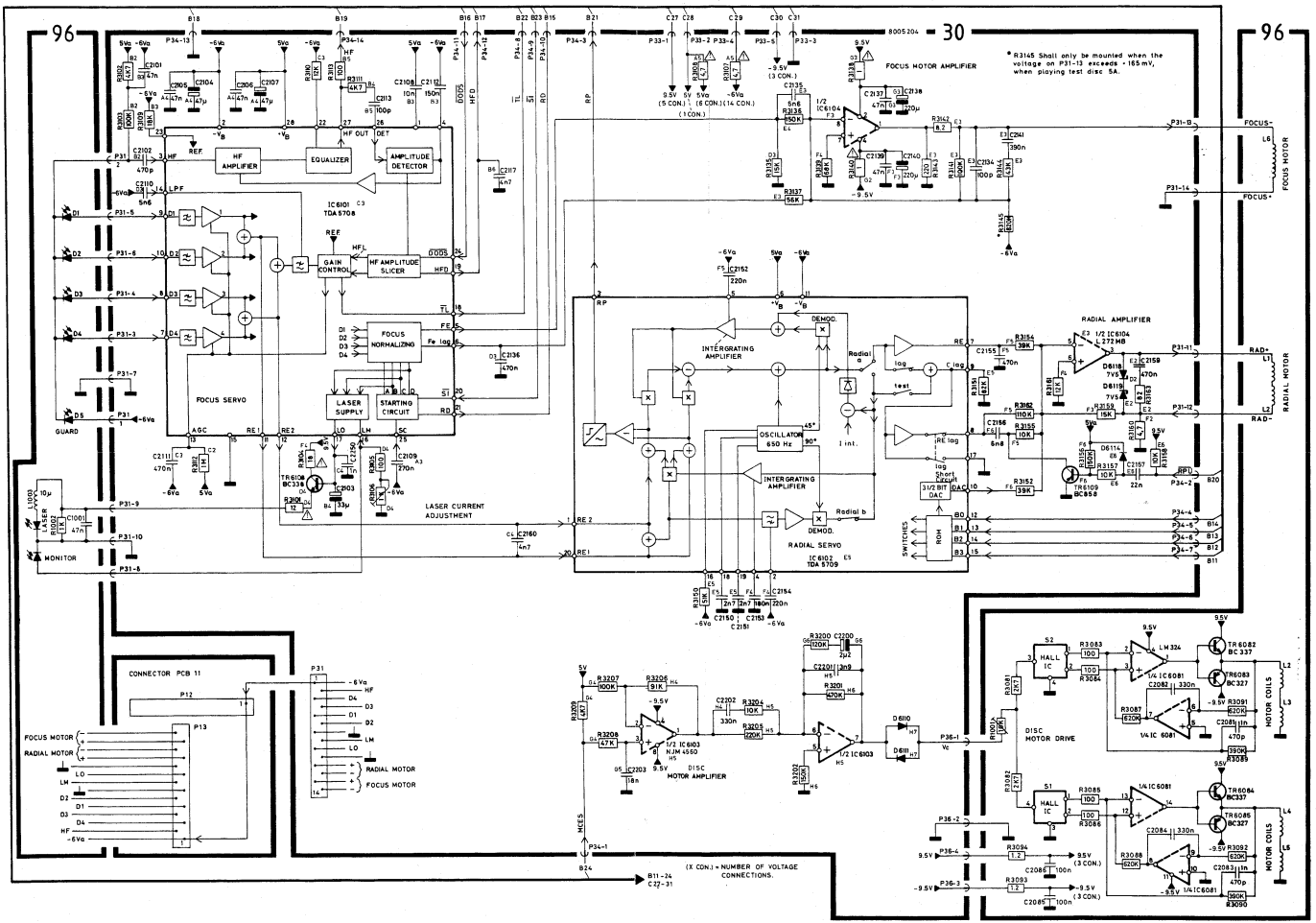
Signalet er beregnet for fremtidigt digitalt udstyr, der kan anvende eventuelle supplerende data på CD-plader. F.eks. til at vise tekst og grafik på en skærm eller til optagelse af CD-plader på en digital båndoptager.

Digital output

From the Beogram CD 5500 the signal can be delivered via the phono bush D-OUT in digital form. The signal is obtained from 5IC9 (SAA 7220) pin 14. 5IC9 and the D-OUT bush are galvanically separaited. The digital signal contains subcode information in addition to the error corrected and filtered audio signal.

This signal is intended for future digital equipment capable of utilizing any possible supplementary data on CD's. For example, for displaying text and graphics on a screen or for recording CD's on a digital tape recorder

DIAGRAM A (Servo and Disc Motor System)

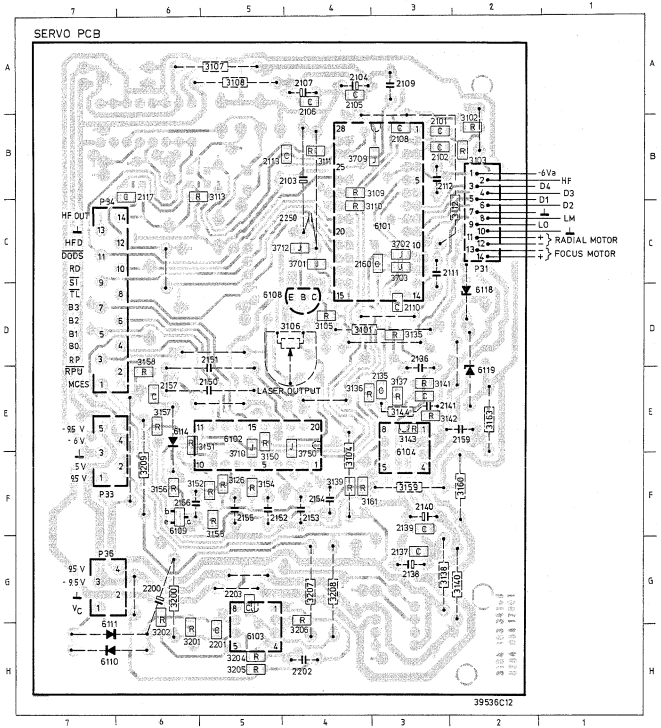


Diagram, PCB drawing and partlist for servo PCB30 without focus off-set adjustment

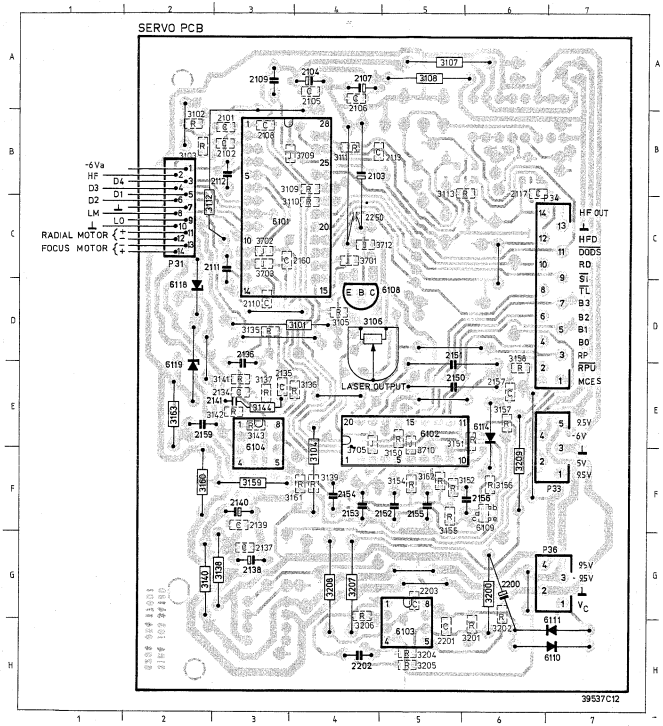
10-2

10-2

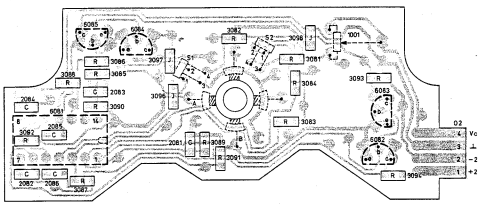
SERVO PCB 30



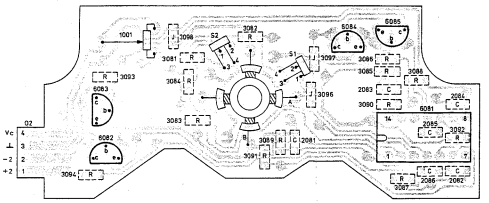
SERVO PCB 30



DISC MOTOR CONTROL



DISC MOTOR CONTROL



LIST OF ELECTRICAL PARTS

PCB 30, 8005204
Servo

20	51	103	125	134	209		

IC6101△ 8340991 **125** TDA 5708 C3
IC6102△ 8340992 **134** TDA 5709
IC6103 8340993 **103** NJM 4560D
IC6104 8340605 **103** L 272MH

TR6108 8320721 **020** BC 338-16
TR6109 8320616 **051** BC 858 B

D6110-D6111 8300058 **209** 1N 4148
D6114 8300058 **209** 1N 4148
D6118-D6119 8300570 **209** HZ 7C2 7V5

R3101	5020966	12 Ω 5%	R3150	5011493	51 kΩ 2% 1/8W
R3102	5011234	4.7 kΩ 2% 1/8W	R3151	5011254	83 kΩ 2% 1/8W
R3103	5011256	100 kΩ 2% 1/8W	R3154	5011491	39 kΩ 2% 1/8W
R3104	5020967	18 Ω 5%	R3155	5011241	10 kΩ 2% 1/8W
R3105	5011218	100 Ω 2% 1/8W	R3156	5011494	150 kΩ 5%
R3106	5370355	1 kΩ 20%	R3157-	5011241	10 kΩ 2% 1/8W
R3107-R3108	5020965	4.7 Ω 2% 1/3W	R3158		
R3109	5011244	18 kΩ 2% 1/8W	R3159	5020074	15 kΩ 1% 1/4W
R3110	5011490	12 kΩ 2% 1/8W	R3160	5020971	4.7 Ω 1% 1/4W
R3111	5011234	4.7 kΩ 2% 1/8W	R3161	5011490	12 kΩ 2% 1/8W
R3112	5020288	1 MΩ 1% 1/4W	R3162	5011504	110 kΩ 2%
R3113	5011218	100 Ω 2% 1/8W	R3163	5010056	82 Ω 5% 1/4W
R3135	5011243	15 kΩ 2% 1/8W	R3200	5020062	120 kΩ 5% 1/4W
R3136	5011259	150 kΩ 2% 1/8W	R3201	5011265	470 kΩ 2% 1/8W
R3137	5011251	56 kΩ 2% 1/8W	R3202	5011494	150 kΩ 5%
R3138	5020964	1.0 Ω 2% 1/3W	R3204	5011241	10 kΩ 2% 1/8W
R3139	5011252	68 kΩ 2% 1/8W	R3205	5011261	220 kΩ 2% 1/8W
R3140	5020964	1.0 Ω 2% 1/3W	R3206	5011255	91 kΩ 2% 1/8W
R3141	5011256	100 kΩ 2% 1/8W	R3207	5020263	100 kΩ 1% 1/4W
R3144	5020968	43 kΩ 1% 1/4W	R3208	5020969	47 kΩ 1% 1/4W
R3145	5011528	820 kΩ 5% 1/8W	R3209	5020049	4.7 kΩ 1% 1/2W

C2101	4010192	47 nF 10% 50V	C2139	4010192	47 nF 10% 50V
C2102	4000249	470 pF 5% 50V	C2140	4200745	220 µF 16V
C2103	4200414	33 µF -10+50% 16V	C2141	4130407	390 nF 10% 63V
C2104	4200482	47 µF 20% 10V	C2150-	4130416	2.7 nF 1% 250V
C2105-C2106	4010192	47 nF 10% 50V	C2151		
			C2152	4130206	220 nF 10% 100V
C2107	4200482	47 µF 20% 10V	C2153	4130314	180 nF 10% 50V
C2108	4000254	10 nF 10% 50V	C2154	4130206	220 nF 10% 100V
C2109	4130379	270 nF 5% 63V	C2155	4130293	470 nF 10% 50V
C2110	4000253	5.6 nF 10% 50V	C2156	4130338	6.8 nF 5% 100V
C2111	4130405	470 nF 5% 50V	C2157	4000255	22 nF 10% 50V
C2112	4130406	150 nF 5% 50V	C2159	4130293	470 nF 10% 63V
C2113	4000248	100 pF 5% 50V	C2160	4010173	4.7 nF 10% 50V
C2117	4010173	4.7 nF 10% 50V	C2200	4200740	2.2 µF 25V
C2134	4000248	100 pF 5% 50V	C2201	4010202	3.9 nF 10%
C2135	4000253	5.6 nF 10% 50V	C2202	4130217	330 nF 5% 63V
C2136	4130405	470 nF 5% 50V	C2203	4130410	18 nF 10%
C2137	4010192	47 nF 10% 50V	C2250	4010035	1 nF 10% 63V
C2138	4200745	220 µF 16V			

P31	7210614	Socket 14 pol	P34	7220657	Plug 14 pol
P33	7220652	Plug 5 pol	P36	7220651	Plug 4 pol

To P5	6275746	Wire w/sokets 5/5 pin	To P6	6275745	Wire w/sokets 14/14 pin

△ betyder at statisk elektricitet kan ødelægge komponenten.
△ indicates that static electricity may destroy the component.
△ bedeutet, daß statische Elektrizität die Komponente zerstören kann.
△ signifi que électricité statique peut detruire le composant.

* Speciel udvalgt eller bearbejdet eksemplar.
* Specially selected or adapted sample.
* Speziell ausgewähltes und bearbeitets Exemplar.
* Exemplaire, spécialement sélectionné et façonne.

Bang & Olufsen

Beogram CD 5500

Nyt CD-løbeværk
New CD drive mechanism

Fra apparat nr. 05858372 er CD-løbeværket ændret fra en type CDM2 til en type CDM4

Ved udskiftning af et CDM2- til et CDM4-løbeværk skal løbeværket og servoprintet udskiftes som en samlet enhed (bestillingsnr. 8420158).

- CD-løbeværk, separat Bestillingsnr. 8420159
- Servoprint, separat Bestillingsnr. 8005264

Laserstrøm og fokus off-set *skal* justeres efter udskiftning af CD-løbeværk eller servoprint.

Servoprintet på et CDM4-løbeværk er ændret på følgende punkter:

	Ny værdi	Bestillingsnr.
R3106	4,7 kΩ (trimmer)	5370058
R3143	22 Ω	5011655
R3145	680 kΩ	5011704
R3155	8,2 kΩ	5011240
R3159	15 kΩ	5010053
R3162	91 kΩ	5011255
R3163	15 kΩ	5010468
C2159	1,5 µF (bipolar)	4200746
C2141	470 nF	4130405

- Der er monteret en modstand (R3214, 220k, bestillingsnr. 5011369) fra ben 6 på IC6103 til ben 21 på IC6101.
- Der er monteret en kondensator (C2143, 1,2 nF, bestillingsnr. 4100283) fra ben 1 på IC6104 til ben 5 på IC6101.

Laserstrøm

Vigtigt:
Efter udskiftning af CD løbeværket eller servo-PCB30 skal laserstrøm-potentiometeret 30R3106 forjusteres, inden apparatet tilsluttes lysnettet.

Tilslut et ohmmeter over 30R3105 + 30R3106. Juster 30R3106, indtil 30R3105 og 30R3106 tilsammen har en værdi på 1 kΩ.

Tilslut et DC-voltmeter over 30R3102.

Tilslut et oscilloskop til ben 27 på 30IC6101.

Ilæg testplade nr. 5 (plade uden fejl, bestillingsnr. 3634031) og tryk PLAY.

Kontroller på oscilloskopet, om der er HF signal. Hvis der ikke er HF signal, slukkes apparatet, og fejlen findes.

Hvis der er HF signal, spilles spor 1 på testplade 5, og 30R3106 justeres, til der måles 50mV ±5mV med DC-voltmeteret.

From unit no. 05858372 the CD drive mechanism has been changed from a CDM2 model to a CDM4 model.

When replacing a CDM2 model with a CDM4 model the drive mechanism and the servo PCB are to be replaced as a single unit (part no. 8420158).

- CD drive mechanism, separate Part no. 8420159
- Servo PCB, separate Part no. 8005264

The laser current and focus off-set *must* be adjusted after the CD drive mechanism or servo PCB has been replaced.

The servo PCB of the CDM4 drive mechanism has the following modifications:

	New value	Part no.
R3105	4.7 kΩ (trimmer)	5370058
R3142	22 Ω	5011655
R3145	680 kΩ	5011704
R3155	8.2 kΩ	5011240
R3159	15 kΩ	5010053
R3162	91 kΩ	5011255
R3163	15 kΩ	5010468
C2159	1.5 µF (bipolar)	4200746
C2141	470 nF	4130405

- A resistor (R3214, 220k, part no. 5011369) is mounted between pin 6 on IC6103 and pin 21 on IC6101.
- A capacitor (C2143, 1.2 nF, part no. 4100283) is mounted between pin 1 on IC6104 and pin 5 on IC6101.

Laser current

Important:
When replacing the CD mechanism or the servo PCB30, the laser current potentiometer 30R3106 must be preadjusted before the set is connected to mains.

Connect an ohmmeter across 30R3105 + 30R3106. Adjust 30R3106 until the combined value of 30R3105 and 30R3106 is 1 kΩ.

Connect a DC voltmeter across 30R3102.

Connect an oscilloscope to pin 27 of 30IC6101.

Load test disc no. 5 (disc without faults, part no. 3634031) and press PLAY.

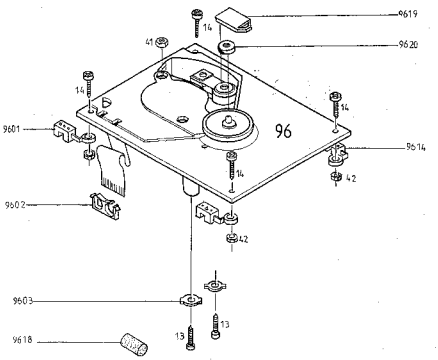
Check on the oscilloscope whether there is any HF signal. If not, switch off the CD player and locate the fault.

If there is an HF signal, play track 1 of test disc 5 and adjust 30R3106 until a reading of 50 mV ±5 mV is obtained on the DC voltmeter.

Fokus off-set
Se side 5-5.

Focus off-set
See page 5-5.

List of Mechanical Parts



30Modul 8005264 Servo PCB

96Modul 8420158 CD Mechanism and Servo PCB as a kit

96Modul 8420159 CD Mechanism without Servo PCB

9601	3333016 Rubber holders
9602	3152593 Clamp f. flexible print
9603	3034077 Transport screw
9614	3333015 Rubber holders
9618	3333017 Rubber foam
9619	3154797 Cover
9620	2893000 Hub

Survey of screws

13	3013145 Screw 3x12 mm
14	2034064 Screw 2x10 mm
41	2380012 Nut M3
42	2380147 Nut

Bang & Olufsen

Beogram CD 6500

Type 5136-5137-5138-5139-5140

Beogram CD6500, type 5136, 5137, 5138, 5139, 5140

See drawings on pages 4-1

List of mechanical parts

9001	3414157	Cabinet
	3414358	Cabinet, white
	3114356	Inner chassis
9008	3454654	Bottom
9030	3451020	CD tray
	3450970	CD tray, white
9043	2542709	Angle f. front
9049	2569175	Front panel
	2569200	Front panel, white

Bang&Olufsen

Beogram CD 7000

Type 5151, 5152, 5153, 5154, 5155

Bang&Olufsen

Beogram CD 7000

List of Mechanical Parts

Exp. view, see page 4-1 and page 4-2

9048	3114325	Chassis front
9049	2569300	Front panel
	2569301	Front panel, white
08T1	8005282	PCB8 w. Transformer

Screws

2	2043011	Screw AM 4x8

Owners Manuals

3505605	Danish
3505606	Swedish
3505607	Finnish
3505608	English
3505609	German
3505610	Dutch
3505611	French
3505612	Italian
3505613	Spanish
3505614	USA - GB
3505615	CDN - F

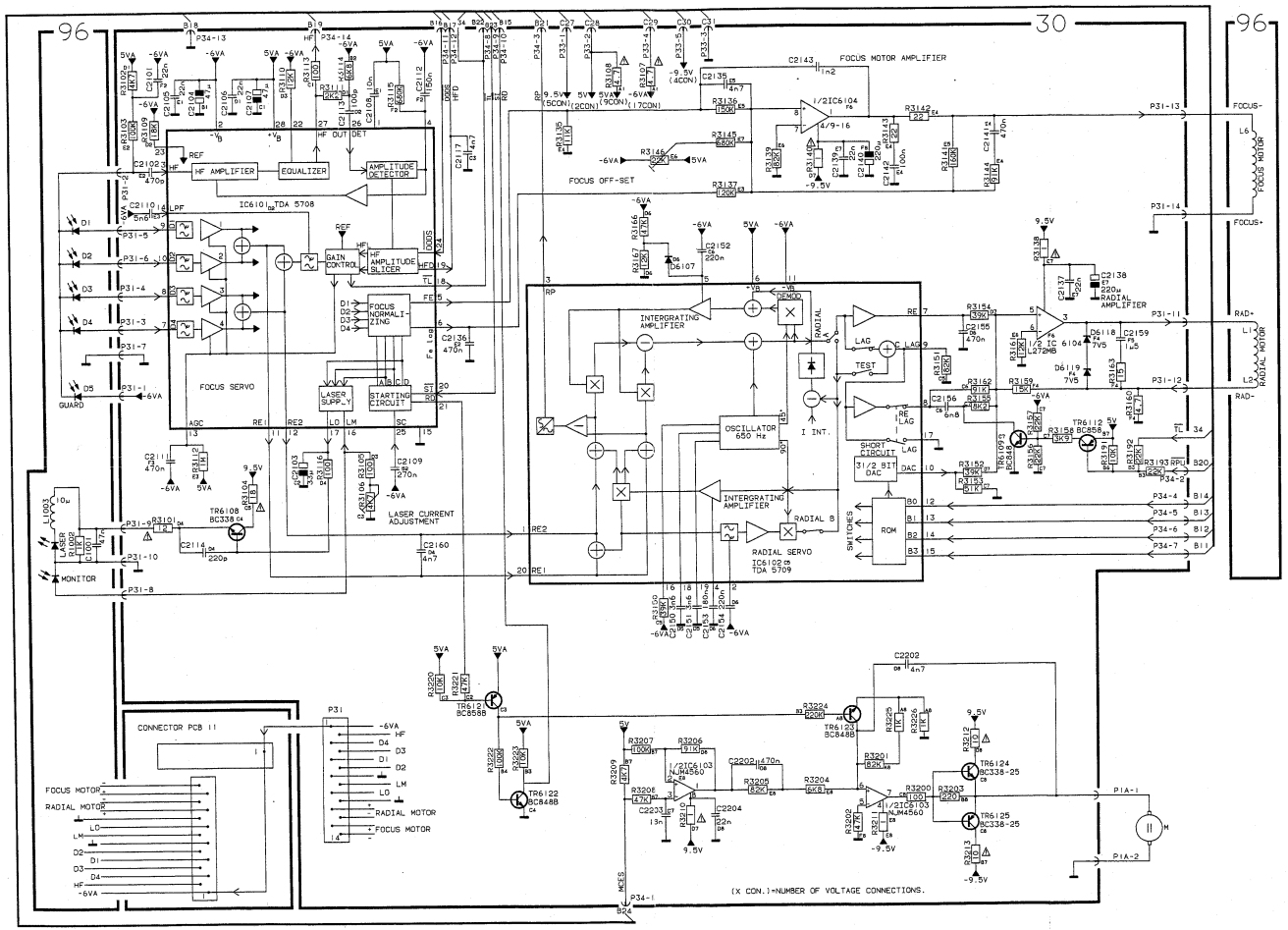
All other electrical and mechanical parts are identical with Beogram CD 6500

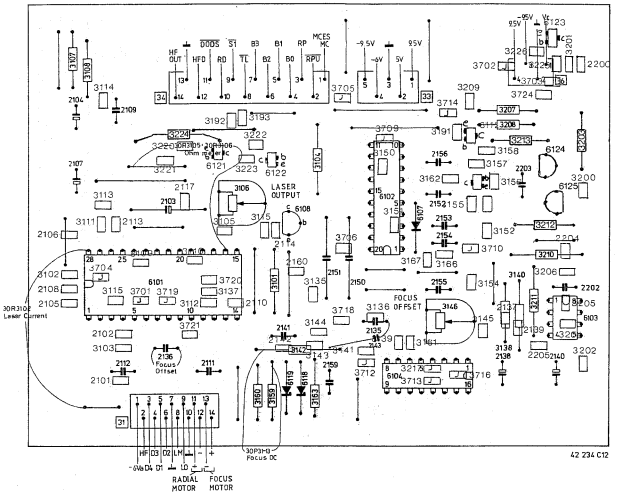
Bang&Olufsen

CD-Mechanism
Version II
Beogram CD 7000

Bang&Olufsen

DIAGRAM A (Servo and Disc Motor System)





20	51	103	125	134	209		
E B C	B C	E B C	28 15 1 14	10 11 1 10	A C		

△ indicates that static electricity may destroy the component.

Resistors not referred to are standard, see page 3-2

PCB 30, 8005288
Servo

IC6101△	8340991	**125**	TDA 5708 C3	IC6103	8340993	**103**	NJM 4560D
IC6102△	8340992	**134**	TDA 5709	IC6104	8340683	**103**	L 272BH
TR6108	8320721	**20**	BC 338-16	TR6122-	8320615	**51**	BC 848B
TR6109	8320615	**51**	BC 848B	TR6123			
TR6112	8320616	**51**	BC 858B	TR6125	8320523	**20**	BC 328-25
TR6121	8320616	**51**	BC 858B				
D6107	8300058	**209**	1N 4148	D6118- D6119	8300570	**209**	HZ 7C2 7V5
R3101	5020966		12Ω 5% 1/3W	R3146	5370327		22kΩ 20% 0.1W
R3104	5020967		18Ω 5% 1/3W	R3160	5020971		4.7Ω 1% 1/4W
R3106	5370324		4,7kΩ 20% 0.1W	R3207	5020263		100kΩ 1% 1/4W
R3107- R3108	5020965		4.7Ω 2% 1/3W	R3208 R3210- R3211	5020969 5020964		47kΩ 1% 1/4W 1.0Ω 2% 1/3W
R3138	5020964		1.0Ω 2% 1/3W	R3212- R3213	5020489		10Ω 10% 0,30W
R3140	5020964		1.0Ω 2% 1/3W				
R3141	5011587		160kΩ 1% 1/8W				
C2101	4000255		22nF 10% 50V	C2139	4000255		22nF 10% 50V
C2102	4000249		470pF 5% 50V	C2140	4200745		220µ 16V
C2103	4200414		33µ -10+50% 16V	C2141	4130405		470nF 50V
C2104	4200482		47µ 20% 10V	C2142	4000256		100nF 10% 50V
C2105- C2106	4000255		22nF 10% 50V	C2143 C2150- C2151	4100283 4130424		1.2nF 2% 250V 3.6nF 1% 160V
C2107	4200482		47µ 20% 10V				
C2108	4000254		10nF 10% 50V	C2152	4130206		220nF 10% 100V
C2109	4130379		270nF 5% 63V	C2153	4130314		180nF 10% 63V
C2110	4000253		5.6nF 10% 50V	C2154	4130206		220nF 10% 100V
C2111	4130405		470nF 10% 50V	C2155	4130405		470nF 10% 50V
C2112	4130406		150nF 5% 50V	C2156	4130338		6.8nF 5% 100V
C2113	4000248		100pF 5% 50V	C2159	4200746		1.5µ 50V Bipolar
C2114	4000233		220pF 5% 50V	C2160	4010173		4.7nF 10% 50V
C2117	4010173		4.7nF 10% 50V	C2200	4010173		4.7nF 10% 50V
C2135	4130370		4.7nF 5%	C2202	4130405		470nF 10% 50V
C2136	4130405		470nF 10% 50V	C2203	4130221		18nF 5% 63V
C2137	4000255		22nF 10% 50V	C2204- C2205	4000255		22nF 10% 50V
C2138	4200745		220µ 16V				
P31	7210614		Socket, 14 pol	P34	7220657		Plug, 14 pole
P33	7220652		Plug, 5 pole	P36	7220651		Plug, 4 pole
To P5	6275746		Wire w/sockets 5/5 pin				
To P6	6275745		Wire w/sockets 14/14 pin				
	8420176		CD Mechanism with servo				
	8420177		CD Mechanism without servo				
	8005288		Servo PCB				
	6276561		Wire bundle				